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ABSTRACT

This project researched and defined learning profiles for educable mentally impaired, visually impaired, low-reading, and regular vocational students based on the communication skills, attitudes toward self and others, knowledge level, and the cultural and social factors for each group. Through analysis of these profiles, and a consideration of the decoding skills and most effective channels of communication required to elicit appropriate responses, the project defined the learning styles of each group. These styles were matched with each vocational task to determine the most appropriate strategies of communication for each group. The project developed, tested, and produced more than 1,300 instructional modules and audio-visual materials designed to accommodate the different learning styles. The vocational areas included in the modules were small engine repair, graphics, medical assistant, dietetic assistant, and maintenance and engineering. The materials were written without sex bias and to portray women and minorities in non-traditional roles. The project also identified environmental barriers to vocational education for physically handicapped students, and developed a means of analyzing required environmental modifications. Pre-revision and post-revision data from vocational instructors and each student group were accumulated to assess the effectiveness of the learning strategies. The twenty-nine sets of modules are available through ERIC (CE 017 555-583). (Author/JH)

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CAPITAL AREA CAREER CENTER

Ingham Intermediate School District

611 Hagadorn Road
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TO:

MULTIPLE LEARNING STRATEGIES PROJECT
FINAL REPORT

CE 017 554

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FINAL REPORT

PROJECT NO. 498AH60038

GRANT NO. G007603808

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MULTIPLE LEARNING STRATEGIES PROJECT

May 31, 1978

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ABSTRACT

Fidelity of communication, the basis of instruction, can be established by developing strategies to overcome educational barriers for handicapped and regular students in an individualized and modularized vocational education curriculum. This project researched and defined learning profiles for educable mentally impaired, visually impaired, low-reading, and regular vocational students based on the communication skills, attitudes toward self and others, knowledge level, and the cultural and social factors for each group. Through analysis of these profiles, and a consideration of the decoding skills and most effective channels of communication required to elicit appropriate responses, the project defined the learning styles of each group. These styles were matched with each vocational task to determine the most appropriate strategies of communication for each group.

The project developed, tested, and produced more than 1300 instructional modules and audio-visual materials designed to accomodate the different learning styles. The materials were written without sex bias and to portray women and minorities in non-traditional roles. The project also identified environmental barriers to vocational education for physically handicapped students, and developed a means of analyzing required environmental modifications.

Pre-revision and post-revision data from vocational instructors and each student group were accumulated to assess the effectiveness of the learning strategies. Field-tests demonstrated that the materials developed by the Multiple Learning Strategies Project significantly enhanced achievement of learning objectives by each group in the vocational student population.

FINAL REPORT

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MULTIPLE LEARNING STRATEGIES PROJECT

Jan Danford
Ingham Intermediate School District
Capital Area Career Center

Mason, Michigan

May 31, 1978

CE 017 554

TABLE OF CONTENTS

i - ii List of Tables

I. Overview of the Project
  A. Individualized modularized instruction program
  B. Special populations

II. Review of Literature
  A. Burlo's communication model
  B. Reynold's Central Michigan and Sullivan's projects for prevocational curriculum materials for special needs students

III. Identification of Target Population
  A. Profile development and category definitions
  B. Profile information for the VI, EMI, LR and RV groups
  C. Learning Treatment profiles

IV. Curriculum modifications and production
  A. Format information for the VI, EMI, LR and RV groups
  B. Format examples and explanations for the different content areas and the different styles
    1. Building Maintenance -- EMI, RV, LR, VI
    2. Graphics -- EMI, RV/LR, VI
    3. Dietetic Assistant -- RV/LR, VI
    4. Medical Assistant -- RV/LR, VI
    5. Small Engine Repair -- RV, LR/EMI, VI
  C. Tapes
  D. Slide-tapes

V. Identification of environmental barriers for the Physically Impaired
  A. Task profile development for the physical requirements in the areas of Building Maintenance, Graphics, Small Engine Repair, Dietetic Assistant, Medical Assistant
  B. Composite tasks and subtasks
  C. Final project report with coding form and subtasks

VI. Evaluation
  A. Evaluation Design: Validated Instruction Associates, Inc.
  B. Conclusions: Validated Instruction Associates, Inc.

VII. Bibliography

VIII. Appendixes
  Appendix A. Teacher Survey
  Appendix B. Student Module Analysis Forms
  Appendix C. Module Analysis Card
  Appendix D. Revision System
  Appendix E. I. Complete Profiles
    II. Graphic Short-Form of Profiles
    III. Treatment Profiles

Appendix F. Revision Recommendations
Appendix G. Module Checklist
Appendix H. Field Test Data Sheet
Appendix I. Slide Tape Revision Sheet
Appendix J. Student Module Evaluation
Appendix K. Job Analysis Reporting Form
Appendix L. Slide-Tape Student Evaluation Sheet
Appendix M. Job Analysis Interpretation Guide
Appendix N. Composite Task
Appendix O. Subtasks
Appendix OO. Composite Task and Subtask Field Test Results
Appendix P. Module Evaluation Form - Field Test of VI Students
Appendix Q. Taped Modules
Appendix R. Revised Module
Appendix S. Memo to Sex and Minority Panel
Appendix T. Report of Sex and Minority Panel
Appendix U. Data Summary Sheet

IX. List of Modules by Program

LIST OF TABLES

Table II Demographic Data (5-26-76) 6-10
Table III Demographic Data (9-15-76) 6-10
Table IV Demographic Data (2-77).............................. 6-11
Table V Demographic Data (9-28-77).............................. 6-12
Table VI Number and Percent of Module Analysis Cards - Revisions 6-14
Table VII Summary of Student Mod Evaluation Data by Learning Style - Building Maintenance.............. 6-17
Table VII Field-Test Data -- Student Mod Evaluation - Building Maintenance .... 6-18 through 6-20
Table VIII Summary of Student Mod Evaluation by Learning Style - Dietetic Assistant.............................. 6-23
Table VIII Field-Test Data -- Student Mod Evaluation - Dietetic Assistant.............................. 6-24 through 6-27
Table IX Summary of Student Mod Evaluation Data by Learning Style - Medical Assistant.............................. 6-30
Table IX Field-Test Data from Student Mod Evaluation - Medical Assistant.............................. 6-31 through 6-32
Table X Summary of Student Module Evaluation Data By Learning Style - Small Engine Repair.............. 6-34
Table X Field-Test Data From Student Mod Evaluation - Small Engine Repair.............................. 6-35 through 6-36
Table XI Summary of Student Mod Evaluation Data by Learning Style - Graphics.............................. 6-38
Table XI Field-Test Data From Student Mod Evaluation - Graphics.............................. 6-39
Table XII Field-Test Data - Slide Tapes.............................. 6-41
Table XIII Instructor Experience - Special Needs Students (1-77). 6-48
Table XIV Instructor Experience - Special Needs Students (10-77) 6-49
Table XV Module Levels of Difficulty (1-77).................. 6-50
Table XVI Module Levels of Difficulty (10-77).................. 6-51
Table XVII Module Clarity (1-77).............................. 6-52
Table XVIII Module Clarity (10-77).............................. 6-53
Table XIX Teaching Strategies (1-77).............................. 6-54
Table XX Teaching Strategies (10-77).............................. 6-55
Table XXI Module Construction (1-77).............................. 6-56
Table XXII Module Construction (10-77).............................. 6-57
Table XXIII Module Transference (1-77).............................. 6-58
Table XXIV Module Transference (10-77).............................. 6-59
Table XXV Industrial Standards (1-77).............................. 6-60
Table XXVII Industrial Standards (10-77).............................. 6-61
Table XXVI Student Interest (1-77).............................. 6-60
Table XXVIII Student Interest (10-77).............................. 6-61

Table XXIX General Questions (1-77).............................. 6-62
Table XXX General Questions (10-77)............................. 6-63
Table XXXI Summary of Selected Items from Teacher Survey, 1-77... 6-66
Table XXXII Summary of Selected Items from Teacher Survey, 10-77.. 6-67
Table XXXIII Pre-Revision Change of Goal Rate..................... 6-69
Table XXXIV Post-Revision Change of Goal Rate.................... 6-70
Table XXXV Pre-Revision Drop Out Rates.......................... 6-71
Table XXXVI Post-Revision Drop Out Rates......................... 6-72
Table XXXVII Pre-Revision Absentee Rates.......................... 6-73
Table XXXVIII Post-Revision Absentee Rates......................... 6-73

CHAPTER I

Overview of the Project

Meeting the needs of students in a comprehensive vocational training program necessitates the identification of students' learning styles and characteristics, the identification of the chosen occupation needs, and the adaptations of these needs into parallel systems of instruction. Vocational programs can no longer confine themselves to only serving populations of students with like skills and interests, but must contend with a group of students with a variety of skills, interests and handicaps.

Because of community interests and legislation mandating equal and appropriate education for all students no matter what their identified handicaps, vocational programs must serve a gamut of students and problems. Educators are now faced with the dilemma of providing appropriate instruction but still maintaining or being fully accountable for maintaining trade standards of excellence.

This project attempted to establish a functional delivery system utilizing modern technology. The system was based on the skills and knowledge required on the job a student selects. Before the students' needs and characteristics can be utilized, a system was designed for individualization where the unique characteristics of the students and presentation mods were identified.

The project attempted to provide alternative curriculum options based upon these needs and characteristics. These options tried to account for different students regardless of physical or mental handicapping characteristics, language barriers, sex, educational level and social/cultural factors.

Ingham Intermediate School District

The project was located at the Capital Area Career Center (CACC), the vocational center for Ingham Intermediate School District in Michigan. Ingham Intermediate School District serves over 63,000 students from 12 public and 17 nonpublic schools in Ingham County. Lansing, the state capital, is the largest school district within the ISD with an enrollment of over 32,000 students.

The vocational program at CACC provides special education programs and services designed to meet the special needs of each handicap person (ages 0 - 25). A full-time special education staff member is assigned at the Career Center to coordinate programming within the Center for each handicap student enrolled there.

Capital Area Career Center. The Capital Area Career Center provides quality level job skills training to students through a unique delivery system. This delivery system:

1. takes into consideration the characteristics of each student, in the selection of occupational training objectives, sequence of study and choice of materials and procedures;

2. allows a student to spend whatever time he/she finds necessary in a given subject area as determined by his/her performance, rather than by the clock; and

3. measures each student's progress by comparing his/her performance with specific objectives rather than with other students.

The CACC program is further characterized by the following factors:

1. Prespecified program goals were initially established through Manpower studies of the community needs and student interests.

2. Performance objectives were established through task analysis and provide the base for curriculum development.

3. Student achievement is measured by actual performance of the specified objectives.

4. Detailed assessment of students' entering and exiting behavior is available.

5. Curriculum materials center around instructional modules.

6. Community cooperation is an integral part of program development, implementation and evaluation.

The CACC occupational program content was developed through task analysis. This analysis involves what is required of an entry level worker, including job skills, job knowledge, job behaviors and basic mathematics and measurement skills. Performance objectives were then established to provide a basis for instruction and a means for evaluating students' and teachers' accomplishment of the skills.

The CACC instructional system is currently based upon learning packages for each identified task. These learning packages consist of modules. A module of instruction is written for each task and provides a detailed, step-by-step procedure whereby the performance objective can be met. These modules allow the student to move through the defined occupational program at their own rate of speed. The instructors are able to direct their attention to individual needs based upon specific occupational goals and specified individual needs.

Upon entering the vocational program, each student completes an individual assessment program to determine his/her present skill and knowledge level in relation to the occupation selected. Each student is then provided with an individual prescription of all the modules he/she will need to complete the occupational program. The modules are grouped together under occupational job skill modules, measurement modules and blueprint reading modules. Each learning prescription is thoroughly different and is designed for the individual needs of the student. Computer technology is utilized in this program.

Each student gets a weekly shcedule that identifies what he/she will be accomplishing for that week. It lists the sequence modules, their numbers, titles, type of instruction involved in each, the work area assigned, and the instructor. If the student works at a faster rate than anticipated, an immediate update of the next modules can be processed.

The instructors are provided with a daily class list at the beginning of the week. This list indicates which students they will have for the day and the modules that they will need to complete. As the student completes a module, the instructor fills in the appropriate form which provides a monitoring system for the instructors and the students. In addition to the constant feedback from the weekly schedules, the student receives an updated learning prescription at regular intervals (at least every nine weeks).

Vocational Education Evaluation Lab. The Capital Area Career Center has established a vocational evaluation lab. The laboratory provides an intensified work sampling evaluation area designed to assist students in making informed occupational choices. These choices are based on the student's interests and aptitudes. The lab is equipped with tools and equipment from various occupations at the Center and a trained evaluator assists the student in experimenting with various occupations. A joint decision is then made as to various careers that the student might wish to follow. The vocational education evaluation lab is a valuable resource for the special needs students.

The Project

The purpose of this project was to systematically design, develop and field test an individualized and modularized vocational education program. Multiple instructional strategies were deisgned to assist each student in the achievement of the objectives regardless of that student's intrabehavior and characteristics. The alternatives, based upon the student's encoding and response capabilities and upon decoding and stimulus strategies available for a given objective, were developed and field tested. The student groups studied were:

1. educable mentally impaired
2. visually impaired
3. low-reading, and
4. regular vocational students.

A profile of characteristics was identified through an analysis of their:

1. communication skills;
2. attitudes toward self and others;
3. knowledge level as it related to occupation selected by the student;
4. cultural factors impeding learning; and
5. social position as it relates to learning.

The occupations for which the alternative strategy modules were written are:

Building Maintenance and Engineering Occupations

Custodian
Building Maintenance
Hospital Custodian
Building Engineer
Carpenter Maintenance
Carpet Cleaner

Graphics - Visual Communication Occupations

Duplicating Machine Operator
Press Operator
Finishing Technician
Camera Person
Compositor

Small Engine Repair

Serviceperson

Health Occupations

Medical Assistant 162
Dietetic Assistant 163

Objectives. The objectives of the project are:

1. Given a task, identified through the task analysis, required of the worker in a given occupation, a learning strategy will be developed, field tested and evaluated so that it will enable an educable mentally impaired student to achieve the task as specified in performance terms.

2. Given a task, identified through the task analysis, required of the worker in a given occupation, a learning strategy will be developed, field tested and evaluated so that a low-reading or visually impaired student will be able to achieve the task as specified in performance terms.

3. Given a task, identified through the task analysis, required of the worker in a given occupation, and an existing Capital Area Career Center module, the module will be revised so that a regular (non-handicapped or non-disadvantaged) student will be able to achieve the task as specified in performance terms.

4. Given a task, identified through the task analysis, required of the worker in a given occupation, an analysis will be made of the task to determine all coding and channel strategies available to communicate the task to the student.

5. Given a task, identified through the task analysis, required of the worker in a given occupation, a module of instruction will be written that incorporates learning strategies for educable mentally impaired students, low-reading students or visually impaired students and regular students developed in objectives 1, 2 and 3 above, so that the module can be used by each student to achieve the task as specified in performance terms.

6. Given a module developed in objective 4, environmental modifications necessary for physically handicapped students will be identified so that if modifications are to be made, the physically handicapped students will be able to achieve the task as specified in performance terms.

7. Given a module completed in objective 5, the module will be free of all sex bias in accordance with criteria established by the Michigan Women's Commission.

8. Given a module, attempts will be made to portray women and minorities in non-traditional roles in all visual, written and oral communication within the module.

9. Given the completed modules and the existing instructional management system at the Capital Area Career Center, the instructional management system will be modified to assure that prescriptive instruction will be managed in a systematic manner.

10. Given a module of instruction developed in the project, the module will be field tested and evaluated so that modification required will be identified and completed.

Sex Bias Criteria. The guidelines established by the Michigan Women's Commission were used as methods and criteria to insure the elimination of sex bias and to assist in portraying women in non-traditional roles. The following criteria were established for the development of modules:

1. Sex stereotype are not to be the basis of assignment of abilities, traits, interests and activities.

2. Actions and achievement of women are to be recognized and incorporated in the modules.

3. Implicit and explicit statements denoting lack of respect for women are to be eliminated.

Results and Products. The following products have been developed, field tested and evaluated as appropriate for educable mentally impaired students, visually impaired and low-reading students, physically handicapped and regular students in vocational education programs:

1. Modules with multiple instruction strategies from Building Maintenance, Graphics, Medical Assistant, Dietetic Assistant, Small Engine Repair;

2. Audio tapes;

3. Slide tapes;

4. Learning and treatment profiles for educable mentally impaired students, visually impaired students, low-reading students and regular vocational students;

5. Identified barriers and adaptations for the physically impaired students.

CHAPTER II

Review of Literature

Review of literature in the area of instructional preparation for vocational education and persons with special education needs has revealed a great emphasis upon identification of roles within an organization; meeting the needs of the special education student; evaluation and identification of students; pre-vocational and career development activities and work experience. Two studies have focused primarily on mainstreaming handicapped students to succeed in the regular classroom (Reynolds, et. al., 1974; Sullivan and Guikema, 1975). Each of these projects were limited to providing instruction that would eliminate entering skill deficiencies. They did not provide strategies for instructional modification designed to enable the handicapped student to achieve vocational competency.

Another project "Mainstreaming: planning for a pre-service program in vocational common industrial arts and physical education" (1976) based at Michigan State University is presently involved in designing a program to develop and implement a program of pre-service activities to help teachers develop the skills necessary to teach handicapped students in regular classroom situations. This project, unlike the previous one cited, focused primarily on helping the regular vocational teacher to be successful in working with handicapped youngsters, in both teaching strategies as well as curriculum modifications.

Reynolds, et. al. (1974), at Central Michigan University, using the occupational skills identified by the Capital Area Career Center, developed a series of instructional resource guides designed to enhance cooperative vocational education/special education. Each of the ten clusters were sub-divided into Common Cluster Tasks and Subclustered Tasks. The Common Cluster Tasks are needed by all workers in occupations within the cluster while the Subcluster Tasks are unique to a specific occupation within the cluster. A task sheet was developed for each task with suggested instructional methods and materials to be used to assist students in achieving the objective. Basic information for cooperative teaching was presented and task related competencies were identified to assist vocational and special education teachers to work with special education students. The students were primarily identified as educable mentally impaired.

Sullivan and Guikema (1975), utilizing the task sheets from Central Michigan University project, have written instructional modules for special education students. Each module is keyed to the task sheets and is designed so that the special education student can master vocabulary and quantative concepts of specified vocational areas. These modules were written to provide instructions that would eliminate entering skill deficiencies and were not designed to provide the handicapped students with instruction in the vocational program.

Modularized Instruction. Most educational systems today are attempting to address the problem of assisting the students to achieve goals and objectives and to provide an alternative approach for students who are unsuccessful. A review of the literature has led many educators to believe that simply modularizing the instructional program will meet individual needs. The assumption behind modularization is that students can meet the objectives if instruction is based on small increments and time. This assumption, however, does not provide alternatives within a module that are specifically designed to enhance the opportunity for a student with his/her entering skills and characteristics to achieve the objectives.

When reviewing instructional modules developed in counties throughout the nation, it is helpful to categorize them for analysis:

Teacher Reference Modules. These modules list a variety of resources the instructor can use to help the class achieve the specified objective. The module is generally not individualized, nor does it contain a step-by-step process for the student to follow. Usually it refers the instructor or student to another source for the actual instructional material and processes.

Selected Strategy Modules for Students. These modules provide one way for all students to achieve an objective. It differs from large group instructions because the student goes through the process individually. The student is not tied to the rest of the class in terms of completing the module. Usually it is a sequential, written or audio presentation of learning experience coupled with specific management which allows for self pacing, individual conferences with the instructor regarding progress, and alternative assignments and/or materials depending on the individual's interests. Often it is dependent upon programmed instruction.

Analysis of existing modules show that the best method of communicating instruction or messages to students have not been carefully determined. The encoding and decoding messages of the student and the materials being presented have not been analyzed carefully.

Questions such as:

What kind of messages should be transmitted orally in the classroom?
What kinds of messages should be transmitted visually, through books?
What kind of messages should be transmitted visually, but not verbally, through pictures, rather than words?
What kind of messages should be transmitted physically, through touch, by having students actually perform certain tasks, examine and manipulate certain objects, etc.?

have not been adequately addressed. Burlo's (1960) communication model addresses these questions. An analysis of:

A. communication skills;
B. attitude toward self and others;
C. knowledge level as it relates to the occupation;
D. cultural factors impeding learning; and
E. social position as it relates to learning

must be considered when developing comprehensive communication and individualized learning systems.

CHAPTER III

Identification of Target Population

In order for a vocational program to meet the special needs of students, a profile of their learning characteristics needed to be identified. Profile information for the visually impaired, educable mentally impaired, low-reader and regular vocational student groups needed to be gathered. Because of time limitations and because the scope of the project was primarily the development of curriculum alternatives, the profile information was gathered through extensive review of existing literature.

Category Definitions

The rules established by the Department of Education for the implementation of Public Act 198 of 1971 were the basis for category definitions for Michigan. These guidelines provide and explain aspects of programming for handicapped children to receive special education services.

Educable Mentally Impaired: Rule 5. "Educable mentally impaired" means a person identified by an educational planning and placement committee, based upon a comprehensive evaluation by a school psychologist, certified psychologist or certified consulting psychologist, and other pertinent information, as having all the following behavioral characteristics:

A. Development at a rate approximately 2 to 3 standard deviations below the mean as determined through intellectual assessment.

B. Scores approximately within the lowest 6 percentiles on a standardized test in reading and arithmetic.

C. Lack of development primarily in the cognitive domain.

D. Unsatisfactory academic performance not found to be based on his/her social, economic and cultural background.

Visually Impaired: Rule 8. "Visually impaired" means a person identified by an educational planning and placement committee, based upon an evaluation by an opthalmalogist, or equivalent, and other pertinent information as having a visual impairment which interferes with learning and having one or more of the following behavioral characteristics:

A. a central visual acuity of 20/70 or less, in the better eye after correction

B. a peripheral field of vision restricted to no greater than 20 degrees.

Low Reader: The low-reader group was very difficult to define. It refers to a group that encompasses both special education and general education. The behavioral manifestation of this group would be that the student was unable to read the materials in his/her chosen occupation. The reading levels, of the group identified as needing reading help, were from third grade to sixth grade. Two groups needed to be identified and referred to in the low-reader group:

Undifferentiated. This group refers to those students who are unable to read because of either motivation, poor instruction, being primarily classified as disadvantaged. They have been diagnosed and tested as not falling into either the learning disabilities or primary reading disabilities category. Their etiology would be environmental.

Primary Reading Disabilities/Learning Disabilities: Rule 13. "Learning disabled" means a person identified by an educational planning and placement committee, based upon a comprehensive evaluation by a school psychologist or certified psychologist or certified consulting psychologist or an evaluation by a neurologist, or equivalent medical examiner qualified to evaluate neurological dysfunction, and other pertinent information, as having all the following characteristics:

A. Disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell or do mathematical calculation.

B. Manifestation of symptoms characterized by diagnostic labels such as perceptual handicap, brain injury, minimal brain dysfunction, dyslexia or aphasia.

C. Development at less than the expected rate of age group in the cognitive, affective or psychomotor domains.

D. Inability to function in regular education without supportive special education services.

E. Unsatisfactory performance not found to be based on social, economic or cultural background.

Regular Vocational Education Students. This group would range from the ages of 14 to 20. The data presented must not be viewed as descriptive of the typical vocational education student, but rather as descriptive of typical vocational education graduates. It is this population which has been studied.

Profile Development

Specialists from the identified areas were hired to research the literature in the field using the above definitions. The profiles of handicapped students were identified through analysis of their:

A. communication skills;
B. attitude towards self and others;
C. knowledge level as it relates to occupation selected by the student;
D. cultural factors impeding learning; and
E. social position as it relates to learning.

The specialists were asked to be as specific and descriptive in their presentation of information. They were also asked to be cautious about sample size, research design and transferability of results. If research was not available, the specialists were asked to make comments on speculations or trends that were considered important. Contacts with other people and/or consultants in the specified area were considered some validation of the information.

The specialists were given an outline of the various areas where information would be pertinent for curriculum revision. For example, in the communication skills area the specialists were asked to gain information about the students' listening skills, speaking skills, reading ability, writing ability and thought processing variables. Mathematics was also seen as important in terms of being able to understand both the language and computation of math. The other areas were equally defined (see appendix A).

The information for each group was further divided into both profile information (this included the learning characteristic of the group) and the learning treatment information (this included the best conditions for learning). Because of the bulk of information presented, the information was further condensed into profiles that showed an approximate range where the group fell in comparison to an "average" population. These dimensions were not to be viewed as being absolute values but were seen as a means by which to communicate information quickly to writers, teachers and artists who would be working on curriculum modification. These factors were seen as a guideline to formulation of formats (see chapter 4) for meeting the individual needs of the specified group. These values pointed out areas that would need direct attention by the modifications and also point to areas that would be considered for reinforcement (see appendix B).

Treatment Profiles

Using the information gained from the specialists, treatment profiles were developed. Written modules, tapes, slide tapes, practice sessions and environmental manipulations were the treatment categories considered. Before appropriate learning strategies could be designed, an analysis of the treatment characteristics and the most appropriate treatment mode for the specified task needed to be analyzed. The most appropriate mode of presentation needed to be matched with the best treatment variables for the specified group. The existing modules at the Capital Area Career Center were analyzed to determine the best mode of presentation (see appendix C Module Analysis Card). Given the presentation modes, the groups were then analyzed to see what variables would produce significant learning results given the mode of presentation. These treatment profiles indicated a difference between a group in terms of the use of special features of graphics, pacing and rate of presentation of material (see appendix D).

Profile and Learning Treatment Information

From the profile and treatment information gathered by the specialists, summaries to help both curriculum writers and instructors to formulate modules specifically designed to meet the needs of the specified groups were written. Summary information included important learning and treatment information for each of the groups.

Regular Vocational Students

I. Important information to consider:

- females are better readers than listeners
- males are better listeners than readers
- have a reading level -2.6 grades below their present grade
- have a hard time expressing themselves in writing
- have a hard time transferring learned knowledge to new situations
- can show you how to do something easier than telling you how to do it
- have been rated as more attentive than their academic peers by vocational teachers
- need to learn step by step with a practice at the end and check points throughout
- perceive themselves as being lower in academic ability, but equal in vocational ability than non-vocational students
- tend to feel more positive about training in a separate center than in a comprehensive high school
- tend to have fewer contacts with guidance personnel for courses on job planning than other groups
- expect to be less competent in learning academic subjects, and act in such a way as to achieve this end
- tend to do well with individualized approaches

II. Treatment consideration:

- for females utilize written vs. verbal instruction
- for males utilize verbal vs. written instruction
- use language that is in line with students reading abilities. Avoid words larger than 3 syllables. Use short, simple, concise sentences
- have students show rather than write or tell for testing
- provide instruction in sequential levels. For example, do not expect transfer unless you structure the learning situation to encourage transfer. The following levels are recommended:

    1. teach basic single concept skills
    2. synthesis - have student combine several basic skills to perform a more complex task
    3. problem solving - have students solve a problem or make a decision using the skills
    4. transfer - have students try out their skills in a new situation

- stress the practical application and why of something rather than the academic concept, e.g., teach math using vocationally oriented materials. Tell students why each piece of information on a resume is important to the employer
- stress hands on experiences
- keep the students' attention focused on the task:
    - use illustrations
    - check points
    - feedback and recall
    - vary time elements
    - require responses from students
    - draw attention to the right and wrong ways and why they are right and wrong

- help students with transfer by referring back - "remember when" cues
- help student generalize from specific knowledge. Show them how a specific piece of knowledge can be applied in several different situations.
- use sequential steps with student check points, e.g., programmed "do it now" cues. Require active participation. Don't use audio tapes that just read instructions.
- teach in small steps and then summarize or require activities that summarize learning
- provide self exploration and self growth experiences
- keep student posted and aware of his improvement; avoid unfavorable comparisons, structure for such comparisons, structure for success, be consistent in your behavior. Remember the self-fulfilling prophecy

Low Reading Students

I. Important information to consider:

- have low listening skills
- have short attention span
- have a hard time responding
- don't ask questions when they don't understand
- have a very hard time decoding technical words
- have a hard time following directions
- have a hard time making generalizations
- have a poor memory
- have a hard time with abstract concepts
- read word by word and lose their train of thought
- do better with hands-on tasks than verbal tasks
- have problems seeing things that are off center - e.g., film on a screen
- get envious about reading and feel inadequate

II. Treatment considerations:

- reduce noise and distractions for the learner
- watch your rate (228 - 328 wpm is best)
- organize your materials well and simply
- use simple, concise words and sentences
- do not expect the student to listen for a long time
- speak distinctly and cue in student to important ideas
- use student's own unique vocabulary and style
- use programmed questions following written passages
- read tasks to student and give oral directions
- use self-paced--immediate feed back instructions
- identify technical words essential to task and clarify them prior to learning
- teach one concept at a time and provide active participation
- teach direction following that has student write directions, read directions to see if they are correct, analyze to see if anything is wrong. Have student follow directions then analyze errors.
- use the following motivational procedures:
    - explain difficulties to student
    - use high impact remedial materials
    - use individual and small group settings
    - behavior modification (use of rewards)
    - tape materials so kids can follow along

- teach new words in context
- provide models of oral and written communication
- always present material in center of screen
- increase motivation to want to read - e.g. use a cartoon to gain attention
- use audio visual materials with written materials
- allow student to discover relationships for himself/herself and apply principles within a variety of tasks. Show how skills apply in several areas. Use a lot of hints
- allow for a number of various situations which call for the response taught
- provide opportunity for recalls or previously learned information
- power of retention - 10% of what they read
  - 20% of what they heard
  - 30% of what they saw
  - 50% of what they saw and heard
  - 70% of what they said as they talked
  - 90% of what they say as they do a thing
- cue them in to what they will be learning - objectives
- use SQ3R method to increase knowledge of content:
  - survey
  - question
  - read
  - recite
  - review
- use highly structured teaching techniques
- provide verbal or written positive reinforcement. Write "Good Job", "You're doing a good job" or "fantastic!".

Educable Mentally Impaired Students

I. Important information to consider:

- has low vocabulary rate; shows deficit in verbal expressive skills, especially in speed and logical associations
- has sequencing problems
- on one direction, has the ability to follow directions equal to normal, but makes 2 - 3 times as many errors when 2 - 4 directions given at a time
- reading based on MA (16 yr. old) should be between actual reading:
  - silent reading 1.4 - 3.0
  - oral reading 1.0 - 4.5
- math based on MA (16 yr. old) between 3.0 - 5.0 actual arithmetic:
  - reasoning 1.0 - 3.0
  - computation 2.5 - 4.5
- short attention span (3 - 4 items)
- transfer of training good if things are identical
- deficient motorically in areas of equilibrium, balance, complex coordination and manipulative dexterity
- has a more lasting icon (memory of after image), thus processe repetitive stimuli at a slower rate
- learns more readily with verbal supportive comments than tangible incentive condition
- has trouble accepting criticism
- tendency to be more defensive and negative in their perceptions of their own behavior

II. Treatment considerations:

- give one verbal direction at a time especially if sequencing is important
- reading level 3.0 or lower because of sequencing and organizational problems
- pace should be slower (rate of transmission of information)
- more trials needed to reach criterion
- because of higher error rate a program for monitoring their work and/or provision for immediate feedback is necessary
- provide rehearsal (process strategy) time
- recall more efficient when given an opportunity to elaborate information than just highlighting physical characteristics
- feedback in the form of right-wrong improves performance as compared to right-no response or no response-wrong
- a positive relationship increases effectiveness of strategies used (reinforcement, punishments)
- develop lessons that call attention to the variety of social signals used in the working world, e.g. video, slide/tape
- use fading technique to instruction. Use external cues to allow student to be successful, then gradually fade out cues
- use color coding to focus attention
- use wide spaces between items so each item gets the attention by itself and does not get lost among the others on the page
- emphasize key words and points to be learned; use underlining, arrows, circling, etc.
- use pictures and illustrations whenever possible to aid both in explaining and attention getting

Visually Impaired Students

I. Important information to consider:

- listening comprehension is best at 175 wpm., but comprehension is not significantly diminished at 225 - 275 wpm.
- average reading rate is 120 wpm. using large type
- handwriting is often poor, because of visual-motor integration problems
- intelligence score is usually in the average range; high on similarities and vocabulary (learned cognitive facts), poor on information and comprehension (information gained through experience)
- highly distractible by auditory stimuli
- frustration limit may be shorter than average
- glare will bother all students; 25% of students extremely sensitive to light
- able to judge distance and space through hearing (if given practice and cues)
- average reading distance is 6.5 inches as compared to 14 inches (related to the pathology of the eye)
- self-image or perception will be related to the student's functioning level
- behavioral reaction to stress; shortening of steps, stiffening of limbs, dropping of head

II. Treatment considerations:

- record lengthy reading materials at 225 - 275 wpm.
- short reading materials recorded optimally at 175 wpm.

- print material in 18 point type, can also be 24 or 32 point type
- instruct in very concrete terms, using as many actual objects as possible
- do not assume any incidental learning
- might consider extending time limits when giving a test or a lengthy written assignment
- in order to gain attention use verbal cues e.g., call student by name, identify sound(s) and the source(s)
- visual presentation enhances immediate recall
- auditory presentation enhances delayed recall; discussion promotes retention
- may need three times as many practices to learn skills e.g., manipulation of tools and parts
- make certain that object of interest is clear and that background is not confusing or distracting
- will need to connect new information (object or fact) to something already understood
- because students may tire easily, schedule sessions that alternate manipulation with listening and written work
- provide oblique source of light
- use low glare paper and use dull finishes on work surface to prevent glare
- teach student to use vision more effectively by visual discrimination training
    1. Use of smaller, or actual size forms; ideal size is about 1" long, preserve integrity of the object

    2. Use of criteria -
        a. texture
        b. size
        c. relationship between objects
        d. temperature changes
        e. object identification
        f. basic skills

    3. Categories of visual training:
        a. form
        b. light - dark
        c. position
        d. inner-detail
        e. size
        f. size and position
        g. detail
        h. position in space
        i. pattern detail
        j. object unification
        k. visual closure
        l. spatial perspective
        m. figure detail
        n. object

- outline significant features of a graph, map, or diagram with heavy black lines (use black marking pen)
- color code most significant points to be referred to in discussion
- lettering must be clear and well-spaced. Use double space between lines and words
- provide extra lighting equipment, high intensity lamps, multiswitch lighting for room

- enlarge pictures to no larger than 8" by 11"
- use high-color contrasting combinations; use dark color on pale color or pale on dark
- ask frequent questions of the student to be sure all information processed
- keep actual work area small -- everything should be within arms reach
- reduce time pressure
- break serious sessions with humor
- treat success and failures as you do with the sighted. Do not let the student lay blame on you for the failure (unless you have goofed)

(See appendix E for complete profiles and references)

CHAPTER IV

Curriculum Modification and Production

Written Module Formats

Based upon the important learning characteristics and treatment consideration for each of the specified groups, different formats were devised. In general, the important characteristics that were considered in the format development were:

1. reading level;
2. graphic representations;
3. format layout;
4. type of print;
5. motivational needs;
6. feedback needs; and
7. distribution of special needs students in each of the occupations.

A variety of formats were devised for the different occupations. Some of the modules have accompanying tapes. The formats available are:

1. Building Maintenance

   Regular Vocational Format
   EMI Format
   Low Reader Format
   Visually Impaired Format

2. Graphics

   Combination Regular Vocational
     Low reader Format with tape
   EMI Format
   Visually Impaired Format

3. Dietetic Assistant

   Regular Vocational Format
   Low Reader Format; includes
     Regular Vocational Student
     Format with tape
   Visually Impaired Format

4. Medical Assistant

   Regular Vocational Format
   Low Reader Format, includes
     Regular Vocational Format
     with tape
   Visually Impaired Format

5. Small Engine Repair

   Regular Vocational Format
   Combination Low Reader Format
     and EMI Format
   Visually Impaired

General Format Guidelines

In developing the various forms of the modules, some general guidelines were used. In the combination mods, whether they are RV/LR or LR/EMI, characteristics from the distinct modules for each specified group were combined. When a tape is not accompanying a written module for the Low Reader group, the format was specifically written for that group. In some occupations, the content did not lend itself to a format that would have a picture illustrating each job step. If this could not be accomplished, a tape accompanies the written module to help the Low Reader to obtain the material.

Format Guidelines for Regular Vocational Students. Use pica type in typing modules.

Cover Page

Module #
Skill Title

Performance Objective Page

You are going to learn:
And in order to do this you will need:
We will know you can do it when:

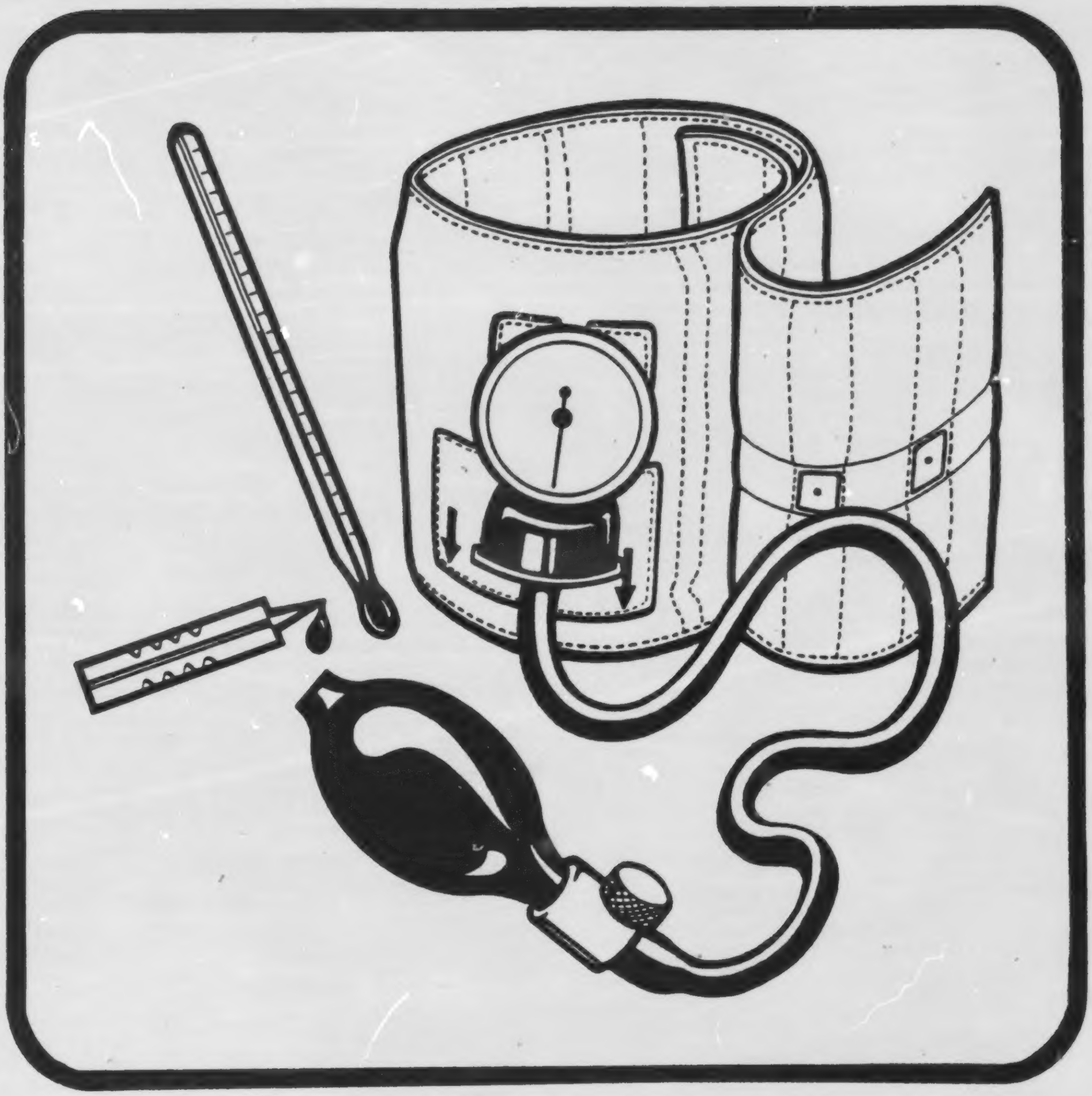
Information Pages (not always included)

A. Tell why they are learning it.
B. Tell them how to proceed or what they are going to do:
  - watch a slide/tape
  - gather equipment

Job Steps Pages

A. Detail job steps necessary to do the task including visuals.
B. Define technical words as you go.

See following pages for example of Regular Vocational Mod



medical assistant

unit: BOOKKEEPING

capital area career center

module: 4401 16 002 date: September 1977 level: III

skill title: How to Prepare Statements for Mailing to Patients With Overdue Accounts

developed & written by: Beverly Varney

visuals by: Sandra Gostomski

WORD GUIDE

STATEMENT - Bill

OVERDUE - Money owed for more than 30 days.

PERFORMANCE OBJECTIVE

YOU ARE GOING TO LEARN:

How to prepare statements for mailing to patients with overdue accounts.

IN ORDER TO DO THIS YOU WILL NEED:

Statements
Typewriter
Ledger cards with accounts 30 or more days overdue

WE WILL KNOW YOU CAN DO IT WHEN:

1. You type the statement using the correct address form, name, and balance due.
2. You write a note to the patient concerning the balance due.

INFORMATION

The following references provides you with necessary information:

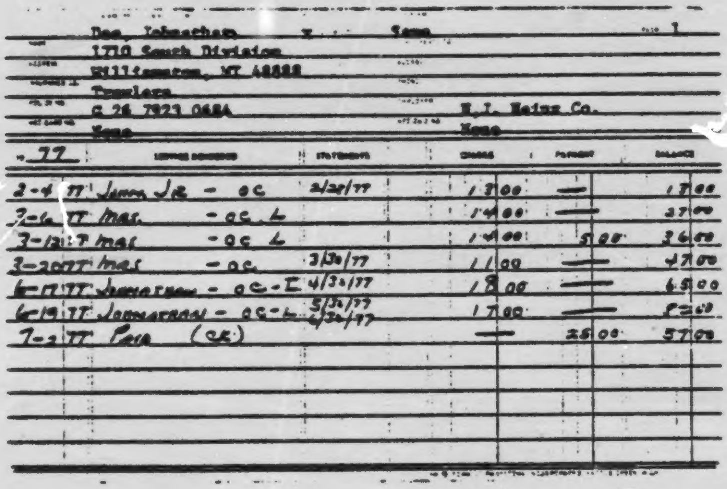
Medical Office Procedures, Bredow, "Bills, pages 112-118.

Secretary's Portfolio of Letters, Parker Publishing Co. Chapter I, A, B, C, D. File Folder 16-2 - Classroom file.

Your Roles As A Medical Assistant, Hardy & Martin, Chapters 10 & 12.

Collecting money from patients with unpaid accounts is a big job. The practice of medicine is a humanitarian, service-type profession. It is also a business which must pay rent, utilities, salaries, and other expenses. Collections are important.

Look at the account card below:



Doe, Johnathan X Same 1
1710 South Division
Williamston, MI 48888
Travelers
G 26 7923 0684 H.J. Heinz Co.
None None

77

2-4 77 John Jr - oc	2/28/77	13 00	—	13 00
3-6 77 Mas. - oc L		14 00	—	27 00
3-12 77 Mas - oc L		14 00	5 00	36 00
3-20 77 Mas - oc	3/30/77	11 00	—	47 00
6-17 77 Johnathan - oc-I	4/30/77	18 00	—	65 00
6-19 77 Johnathan - oc-L	5/30/77 6/30/77	17 00	—	82 00
7-2 77 Pmt (ck)		—	25 00	57 00

You can see that Mr. Doe has been letting his balance build up over a four month period. He made only one small payment. One correct way to bill this account would be the following:

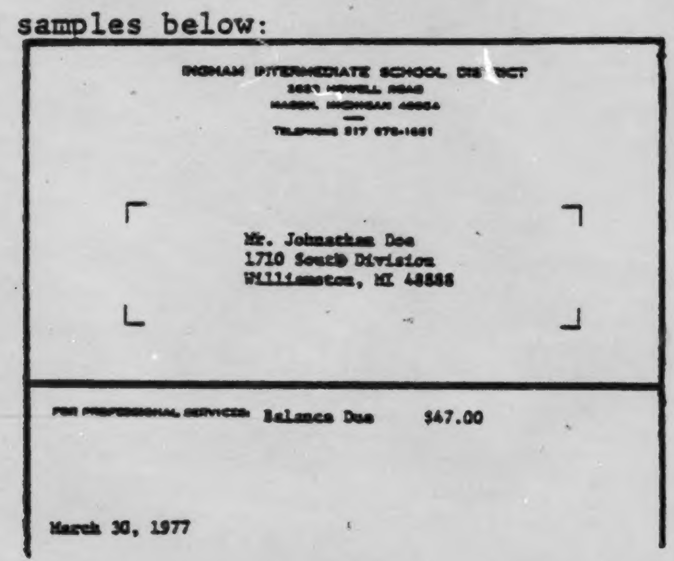
2/28/77 - Just state the balance due.
3/30/77 - Just state the balance due.
4/30/77 - State the balance due and write "May we please hear from you soon."
5/30/77 - State the balance due and write "May we please receive a payment or hear from you regarding your

INFORMATION

bill before June 15.

6/30/77 - State the balance and write "We have not received payment nor heard from you about your bill. If we do not hear from you by July 10, we will be forced to contact a collection agency."

Look at the samples below:



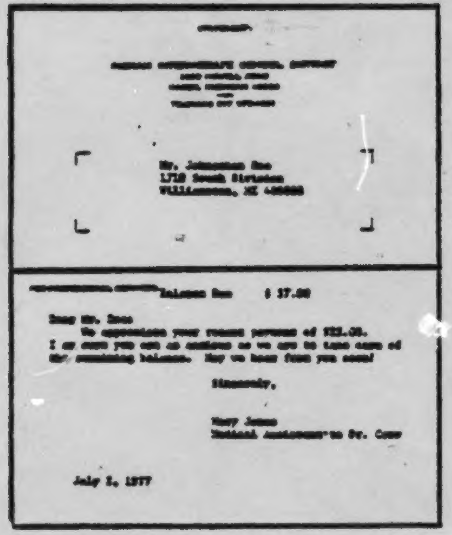
INGHAM INTERMEDIATE SCHOOL DISTRICT

Mr. Johnathan Doe
1710 South Division
Williamston, MI 48888

Balance Due $47.00

March 30, 1977

When you receive payment, be sure to acknowledge it.



It is important to look over the patient's payment record in order to get an idea of their payment "history". If they have always paid their bills and suddenly begin to slack off with their payments you may want to contact them by phone.

INFORMATION

There may be some financial problem. You probably will not "get tough" with a person who has always paid their bills. You should be firmer with a patient who has a "history" of non payment.

JOB STEPS

1. Get the account cards from the file and collect the rest of your materials.

2. Look at the last date in the "statements" column. Pretend it is one month later than that date. Send a statement to the patient. Statements are usually sent monthly.

3. Ask yourself these questions:

   When was the last payment made?
   How much money is owed?
   How long has it been owed?
   Has this patient usually paid?
   Has this patient always been difficult to collect from?

4. Look at the sample letters in the Medical Office Procedures reference and in Secretary's Portfolio of Letters. If a letter is necessary, choose one which fits the situation.

5. Check your choices with your instructor.

6. Get three statements and type the statements ready for mailing.

7. Have your instructor check your work.

8. Be ready to answer the following points:

   A. Name five things you need to consider before billing a patient.

   B. How often will you send statements?

Format Guidelines for EMI Modules. Use of large type (both upper and lower case)

Performance Objective Page

What you will learn:
What you will need:
What you must do:

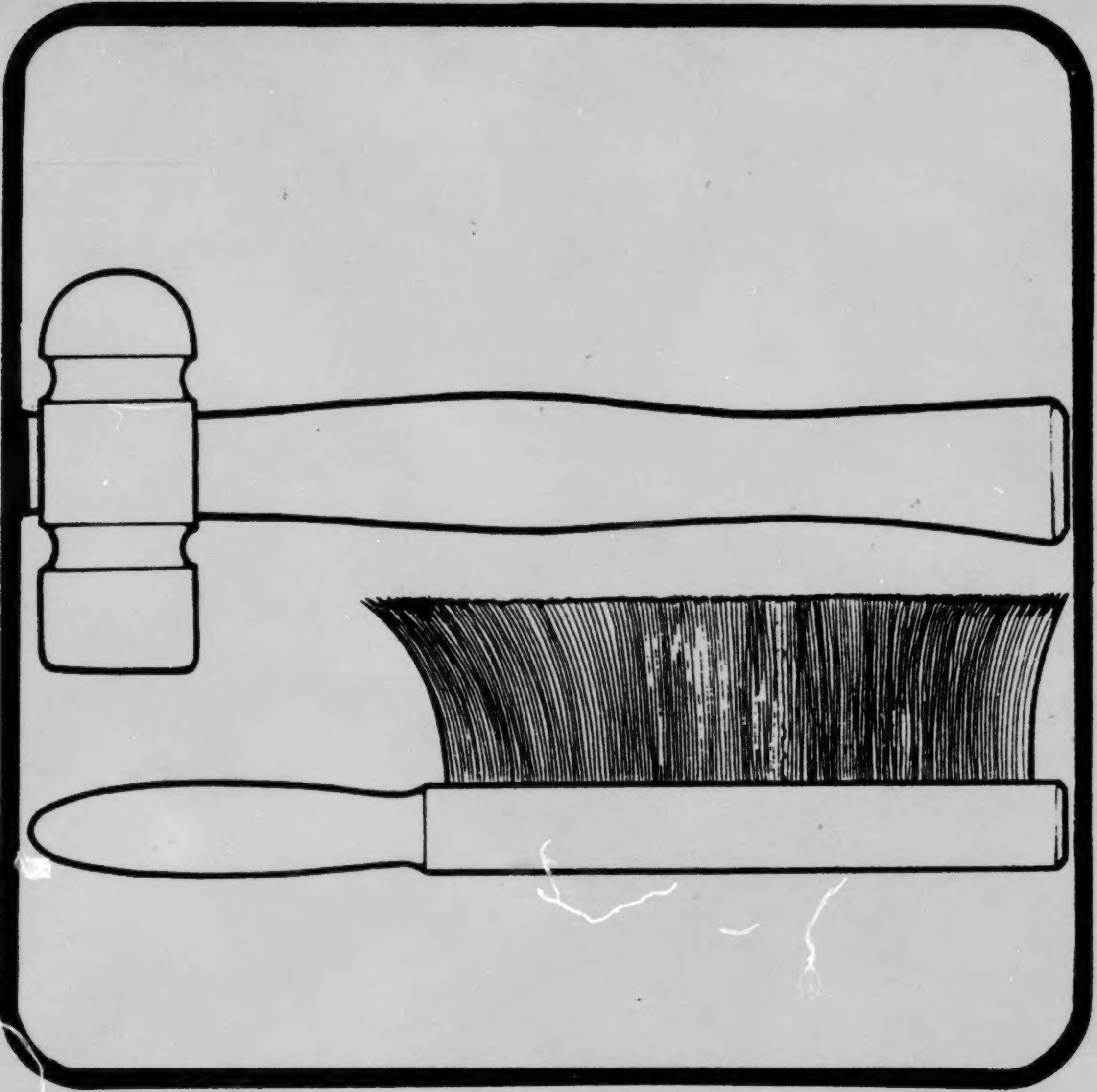
Job Steps Pages

Read - provide cognitive information; gives some organizational cues
Look - use of graphics which would increase transfer
Do - to have them practice step
Check - monitoring, feedback system

The read, look, do, check system provides a way of organizing for the EMI student. The system also provides active participation by the instructor.

Checklists with both graphics and words will be provided to foster active responding without having to rely on low content recall.

See following pages for example of EMI modules



building maintenance & engineering

unit: CABINET CONSTRUCTION

capital area career center

module: 2201 21 001 1 date: FEBRUARY 1977 level:

skill title: WORKING DIAGRAM (LAYOUT)

developed & written by: MIKE POLEN

visuals by: GLEN COOLEY

WORD GUIDE

HEIGHT - HOW HIGH A THING IS.

WIDTH - HOW WIDE A THING IS.

DEPTH - HOW FAR A THING IS FROM FRONT TO BACK.

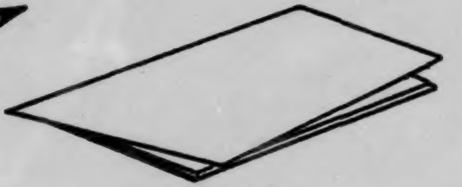
PERFORMANCE OBJECTIVE

WHAT YOU WILL LEARN:

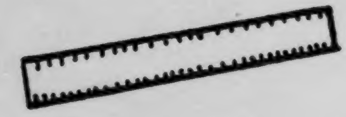
HOW TO MAKE A DRAWING (LAYOUT) OF A CABINET.

WHAT YOU WILL NEED:

PENCIL



DRAWING PAPER



RULER

WHAT YOU MUST DO:

1. READ THE JOB STEPS.
2. MAKE A DRAWING OF A CABINET THAT SHOWS THE HEIGHT, WIDTH, AND DEPTH.
3. MEASURE AND WRITE DOWN THE INCHES FOR THE HEIGHT, WIDTH, AND DEPTH.

"TURN THE PAGE"

WORD GUIDE

SCALE - A PICTURE OF SOMETHING REAL, WITH ALL SIZE RELATIONSHIPS THE SAME ON THE PAPER AS ON THE OBJECT.

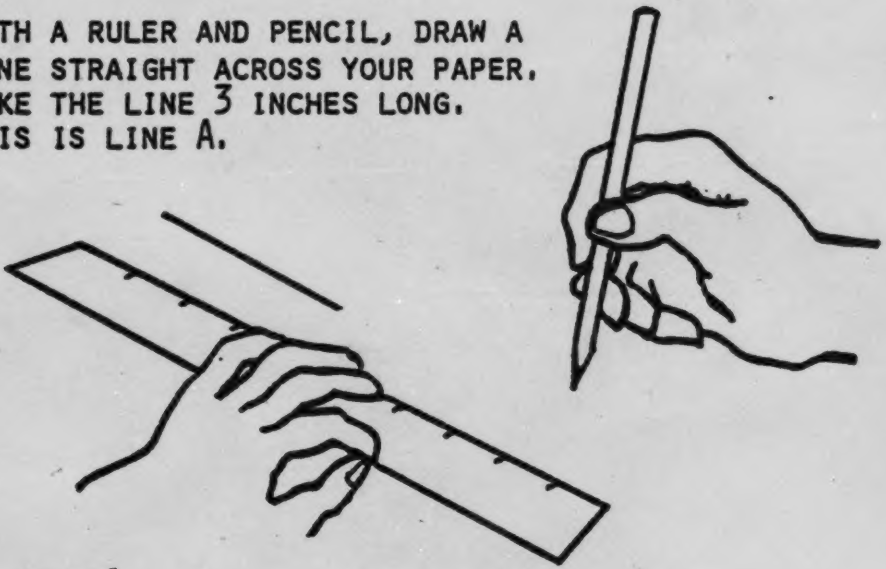
READ: REMEMBER THE SCALE OF YOUR DRAWING WILL BE 1 INCH TO 1 FOOT. THIS MEANS THAT 1 INCH ON YOUR DRAWING WILL BE THE SAME AS 1 FOOT ON THE REAL CABINET THAT YOU WILL MAKE. IF YOUR DRAWING IS 2 INCHES HIGH YOUR CABINET WILL BE 2 FEET HIGH.

CHECK: TELL YOUR INSTRUCTOR HOW HIGH YOUR REAL CABINET WILL BE IF YOUR DRAWING IS 3 INCHES HIGH.

JOB STEPS

READ: 1. WITH A RULER AND PENCIL, DRAW A LINE STRAIGHT ACROSS YOUR PAPER. MAKE THE LINE 3 INCHES LONG. THIS IS LINE A.

LOOK:



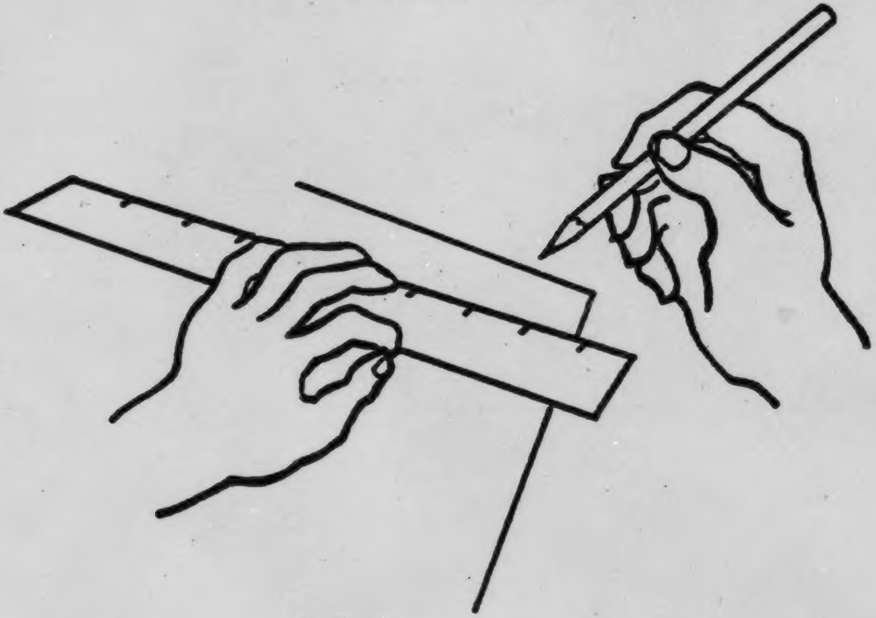
DO: DO JOB STEP 1.

CHECK: ASK YOUR INSTRUCTOR TO CHECK YOUR WORK.

"TURN THE PAGE"

READ: 2. NOW DRAW A LINE STRAIGHT DOWN FROM THE LEFT END OF YOUR FIRST LINE. MAKE THIS LINE 4 INCHES LONG. THIS IS LINE B.

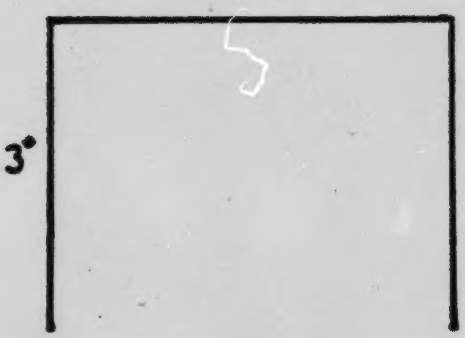
LOOK:



DO: DO JOB STEP 2.

READ: 3. DRAW LINE C THE SAME LENGTH AS LINE A. WRITE "3 INCHES" BESIDE THE LINE.

LOOK:

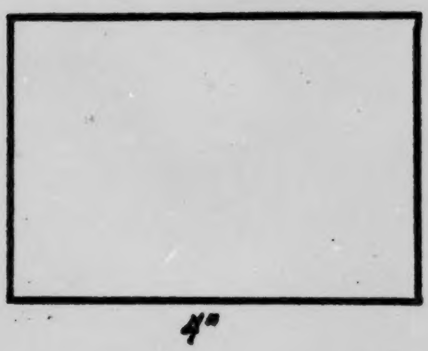


DO: DO JOB STEP 3.

"TURN THE PAGE"

READ: 4. Now draw line D the same length as line B. Write "4 inches" beside the line.

LOOK:

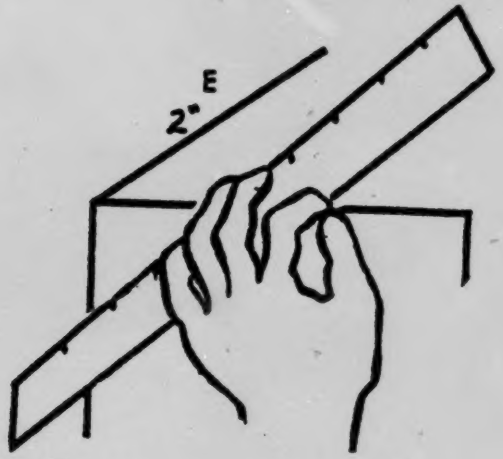


DO: Do job step 4.

CHECK: Ask your instructor to check your work.

READ: 5. Draw line E. Write "2 inches" beside the line.

LOOK:

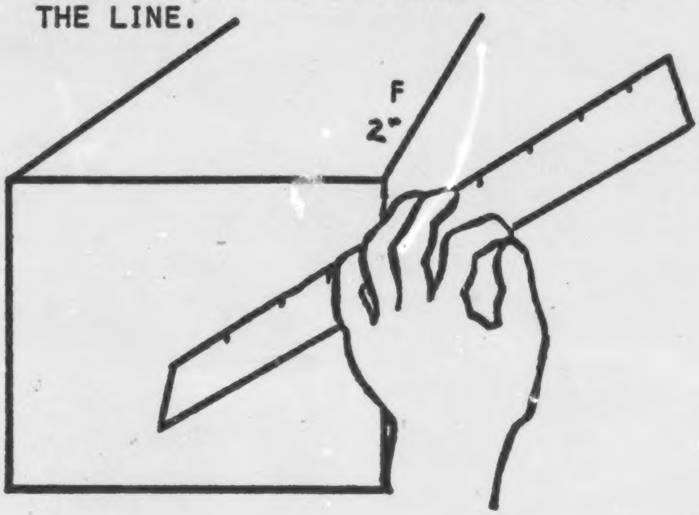


DO: Do job step 5.

"Turn the page"

READ: 6. DRAW LINE F THE SAME LENGTH AS LINE E. WRITE "2 INCHES" BESIDE THE LINE.

LOOK:

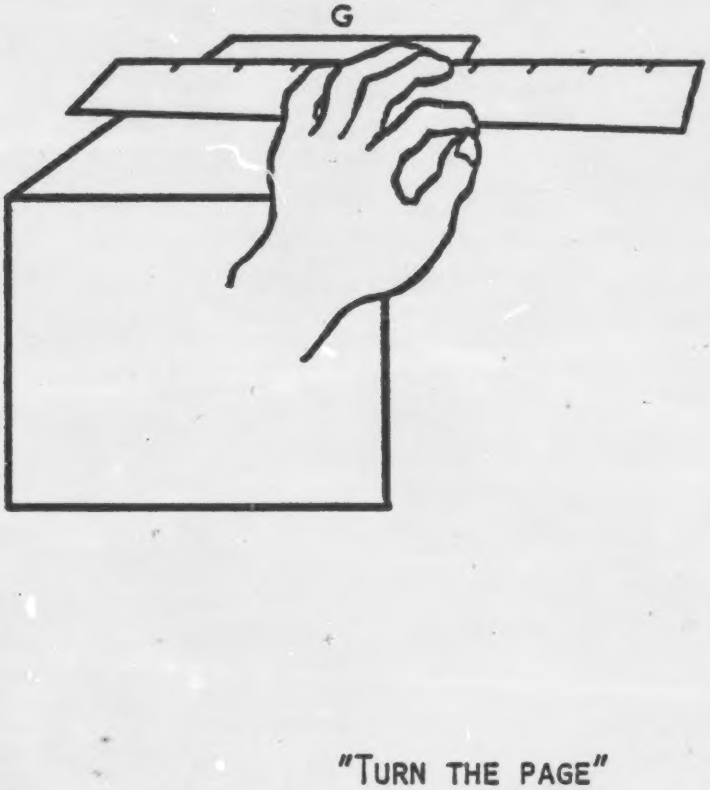


DO: Do JOB STEP 6.

CHECK: ASK YOUR INSTRUCTOR TO CHECK YOUR WORK.

READ: 7. CONNECT LINES E AND F WITH LINE G. LINE G SHOULD BE THE SAME LENGTH AS LINE A. WRITE "3 INCHES" BESIDE THE LINE.

LOOK:

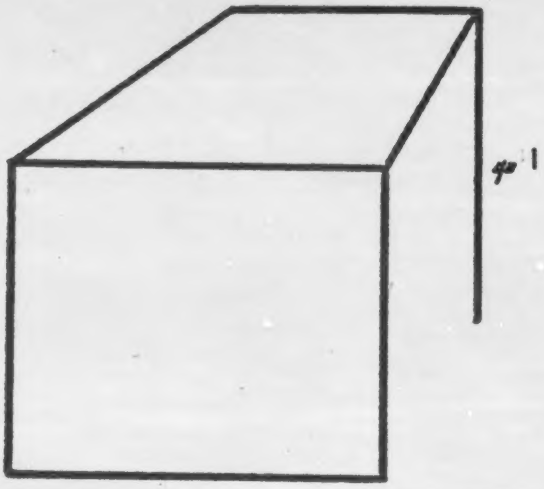


DO: Do JOB STEP 7.

"TURN THE PAGE"

READ: 8. Draw line I the same length as line D. Write "4 inches" beside the line.

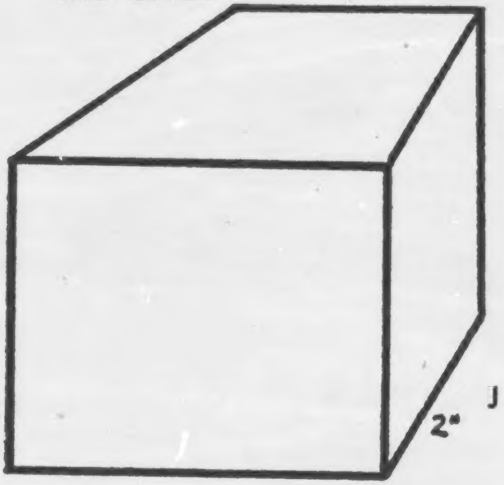
LOOK:



DO: Do job step 8.

READ: 9. Draw line J the same length as line F. Write "2 inches" beside the line.

LOOK:



DO: Do job step 9.

CHECK: Take your drawing to your instructor.

Format Guidelines for Visually Impaired Modules. Use block type - 18 point size

Performance Objective Page

You are going to learn:
In order to do this you will need:
We will know you can do it when:

Job Step Pages

A. Tell why they are learning it.
B. Provide student with opportunity for questioning.
C. Detail job steps necessary to do the tasks. Visuals are line drawings, background minimal, extraneous details eliminated.
D. Process steps are indicated by cues of numbers and arrows.

Printed on 11" x 8 1/2" size paper. Paper is low glare (black print on light green paper).

Special Typing Directions

1. Double spaces between words.
2. Space and 1/2 between lines.
3. Three spaces between job steps.

For optional learning and retention, a tape will accompany the written module.

See following pages for example of Visually Impaired Module

medical assistant

unit: TELEPHONING

capital area career center

module: 4401 09 010 7 date: 3/77 level: I

skill title: HOW TO FIND INFORMATION ON LONG DISTANCE TELEPHONE NUMBERS

developed & written by: BEVERLY VARNEY

visuals by:

PERFORMANCE OBJECTIVE

YOU ARE GOING TO LEARN:

HOW TO FIND LONG DISTANCE TELEPHONE NUMBERS AND INFORMATION.

AND IN ORDER TO DO THIS YOU WILL NEED:

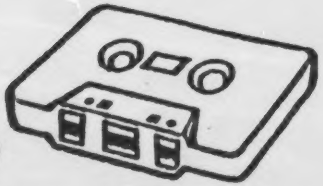
LANSING AREA TELEPHONE DIRECTORY

PEN

SCRATCH PAPER

WE WILL KNOW YOU CAN DO IT WHEN:

YOU CORRECTLY ANSWER QUESTIONS USING THE TELEPHONE DIRECTORY AS A REFERENCE.



A TAPE OF THIS MODULE IS AVAILABLE

WORD GUIDE

AREA CODE - A NUMBER GIVEN TO A CERTAIN AREA OF A STATE FOR DIRECT DISTANCE DIALING.

DIRECT DISTANCE DIALING (DDD) - A SYSTEM FOR REACHING A LONG DISTANCE NUMBER WITHOUT OPERATOR ASSISTANCE.

INFORMATION

DIRECT DISTANCE DIALING (DDD) - DIRECT DIALING IS THE FASTEST AND MOST CONVENIENT WAY TO MAKE LONG DISTANCE CALLS. THE INTRODUCTORY PAGES OF YOUR TELEPHONE DIRECTORY LIST THE AREA CODES FOR MANY CITIES IN THE UNITED STATES AND CANADA.

WORD GUIDE

ACCESS CODE - A NUMBER DIALED CONNECTING YOU TO DIRECT DIALING EQUIPMENT.

INFORMATION

DIALING PROCEDURES - IN SOME LOCATIONS, YOU START DDD WITH A CODE OR ACCESS NUMBER. THIS CONNECTS YOU WITH THE DDD EQUIPMENT. REFER TO YOUR DIRECTORY FOR SPECIFIC INSTRUCTIONS. THE FOLLOWING PROCEDURES APPLY TO ALL DDD:

> IF THE AREA CODE OF THE PERSON YOU'RE CALLING IS THE SAME AS YOURS, DIAL THE ACCESS NUMBER AND THE REGULAR NUMBER. DO NOT DIAL THE AREA CODE.
>
> IF THE AREA CODE OF THE PERSON YOU'RE CALLING IS DIFFERENT FROM YOURS, DIAL THE ACCESS CODE, THEN THE AREA CODE AND THE REGULAR LOCAL TELEPHONE NUMBER.

REACHING THE WRONG NUMBER - IF YOU REACH THE WRONG NUMBER, DIAL "O" (OPERATOR) AND TELL HER SO YOU WON'T BE CHARGED FOR THE CALL.

INFORMATION

DIALING LONG DISTANCE DIRECTORY ASSISTANCE - IF YOU DO NOT KNOW THE TELEPHONE NUMBER OF THE PERSON YOU WANT TO CALL, YOU CAN REACH LONG DISTANCE DIRECTORY ASSISTANCE BY DIALING YOUR ACCESS CODE (IF REQUIRED IN YOUR LOCATION) PLUS THE AREA CODE FOR THE PLACE YOU WANT, AND 555-1212. AND WRITE THE NUMBER DOWN FOR QUICK, EASY REFERENCE. IF THE NUMBER YOU WANT IS IN YOUR AREA CODE, DIAL THE ACCESS CODE, AND 555-1212. WHEN THE DIRECTORY ASSISTANCE OPERATOR ANSWERS, GIVE HER THE NAME OF THE CITY OR TOWN FIRST, AND THEN THE NAME OF THE PERSON YOU WANT. THERE IS NO CHARGE FOR DIRECTORY ASSISTANCE CALLS.

TURN TO THE PAGES IN THE FRONT OF THE LANSING AREA
52 PHONE DIRECTORY TITLED "LONG DISTANCE". READ THESE PAGES. 53
YOU NEED TO LOOK AT THEM TO ANSWER THE QUESTIONS.

JOB STEPS

1. WRITE THE ANSWERS TO THE FOLLOWING ON SCRATCH PAPER. CHECK YOUR ANSWERS WITH YOUR INSTRUCTOR.

    1. WHAT IS THE ACCESS CODE USED FOR DDD?

    2. WHAT IS THE AREA CODE FOR THE LANSING AREA?

    3. TO REACH LONG DISTANCE DIRECTORY ASSISTANCE, WHAT 7 DIGIT NUMBER DO YOU DIAL?

    4. ARE YOU CHARGED FOR A DIRECTORY ASSISTANCE CALL?

    5. ARE YOU CHARGED IF YOU REACH THE WRONG NUMBER? WHAT DO YOU DO IF YOU REACH THE WRONG NUMBER?

JOB STEPS

6. IF YOU CANNOT FIND THE AREA CODE YOU WANT IN THE PHONE BOOK, HOW CAN YOU GET IT?

7. WRITE THE ELEVEN NUMBERS YOU MUST DIAL TO GET A NUMBER IN:

    A. ARIZONA

    B. FRESNO, CALIFORNIA

    C. SPRINGFIELD, MISSOURI

    D. FORT WORTH, TEXAS

JOB STEPS

9. WHAT TIME OF DAY CAN YOU CALL AT THE LOWEST RATE?

10. HOW MANY AREA CODES ARE THERE IN MICHIGAN? WHAT ARE THEY?

ANSWER PAGE FOR INSTRUCTOR.

1. ONE
2. 517
3. 555-1212
4. NO.
5. NO. REPORT THE WRONG NUMBER REACHED TO THE OPERATOR.
6. DIAL "0" FOR OPERATOR ASSISTANCE.
7. A. 1-602-555-1212

   B. 1-209-555-1212

   C. 1-417-555-1212

   D. 1-817-555-1212

ANSWER PAGE FOR INSTRUCTOR.

8. 1-555-1212

9. 11 P.M. TO 8 A.M. ANYDAY
8 A.M. TO 5 P.M. ON SUNDAY 60% DISCOUNT
ALL DAY SATURDAY

10. FOUR. 906, 517, 313, AND 616.

Format Guidelines for Low Reader Module

Cover Page

Module #
Skill Title

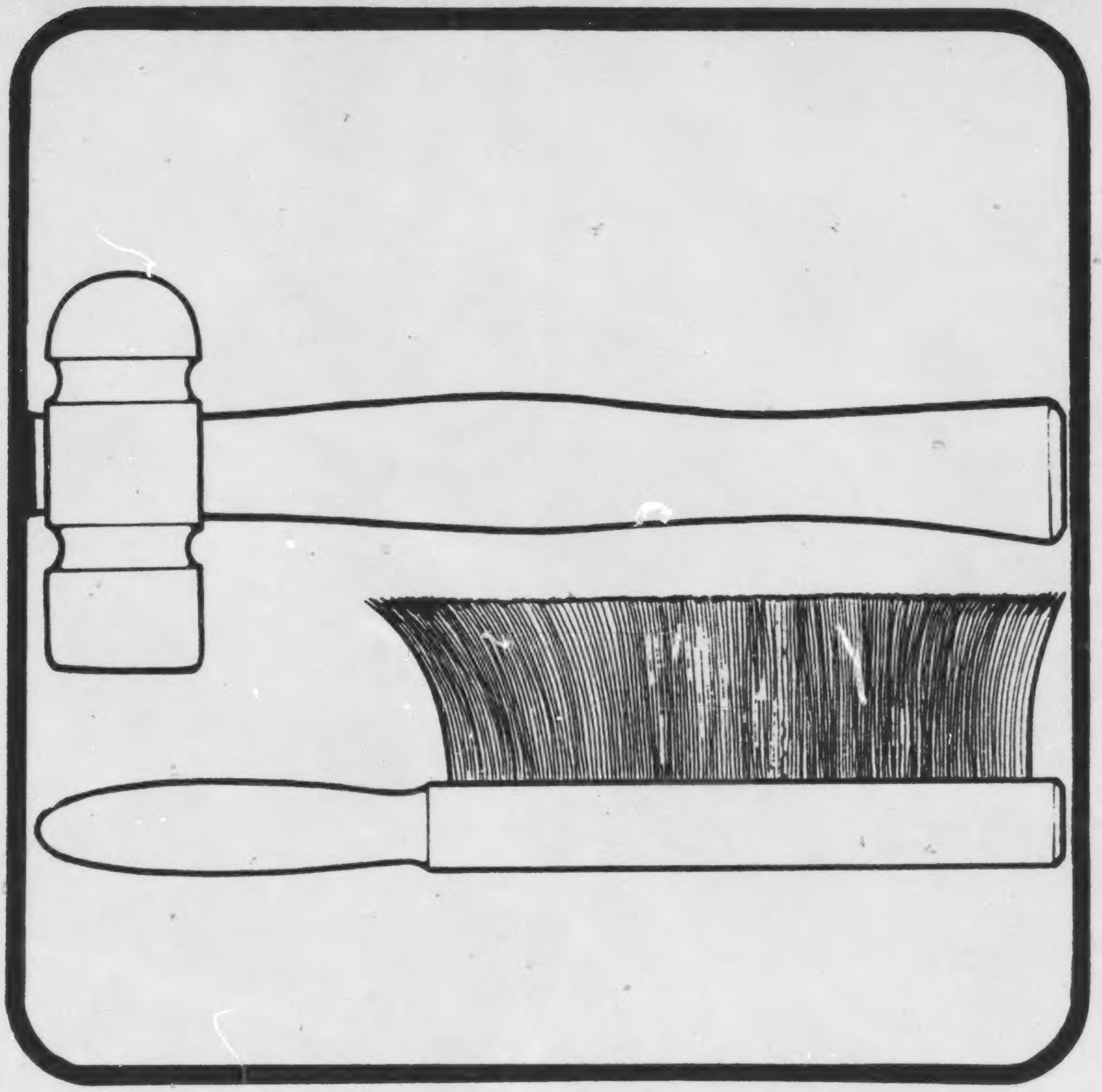
Performance Objective Page

What you will learn:
What you will need:
What you must do:

Job Steps Pages

A. Why are you doing it?
B. What do you do (procedures)?
  - listen to tape/slide
  - get your equipment
  - read module
C. Sequential job steps - extensive visuals

See following pages for example of Low Reader Module



building maintenance & engineering

unit: CHALKBOARD CARE

capital area career center

module: 2201 04 001 3 date: JANUARY 1977 level: I

skill title: "BREAKING IN" A NEW CHALKBOARD

developed & written by: A. STEINBERG

visuals by: SHERRI BAKER

WORD GUIDE

CHAMOIS - A SOFT CLOTH MADE FROM ANIMAL SKINS, USED FOR RUBBING OR BUFFING.

"BREAK IN" - TO PREPARE AN ITEM FOR LATER USE.

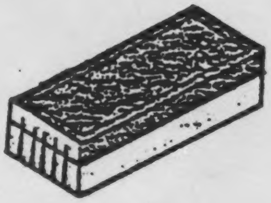
PERFORMANCE OBJECTIVE

YOU ARE GOING TO LEARN:

HOW TO "BREAK IN" A NEW CHALKBOARD.

AND IN ORDER TO DO THIS YOU WILL NEED:

3 TO 4 STICKS OF CHALK



FELT ERASER

CHAMOIS OR
COTTON CLOTH

WE WILL KNOW YOU CAN DO IT WHEN:

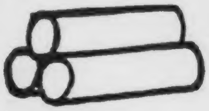
YOU HAVE COMPLETED THE JOB STEPS BY "BREAKING IN" A NEW CHALKBOARD.

INFORMATION	MATERIALS	LOCATION OF MATERIALS
WHY DO YOU "BREAK IN" A NEW CHALKBOARD? IF YOU DO NOT "BREAK IN" A NEW CHALKBOARD, THE WRITING ON THE BOARD WILL NOT ERASE COMPLETELY. BY "BREAKING IN" A NEW CHALKBOARD, YOU CAN BE SURE THE WRITING ON THE BOARD WILL ERASE COMPLETELY.		

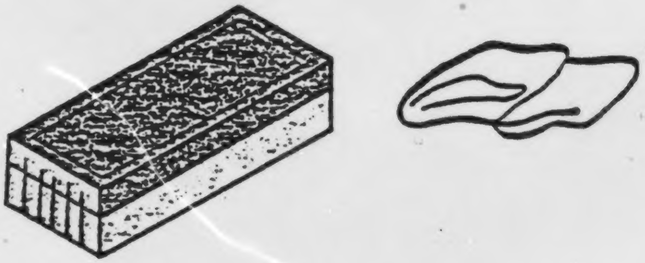
WORD GUIDE

SURFACE - THE OUTER FACE OF SOMETHING.

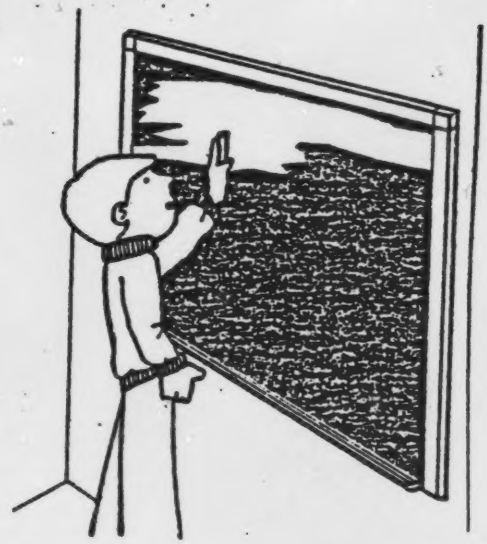
CIRCULAR MOTION - MOVING IN A CIRCLE.



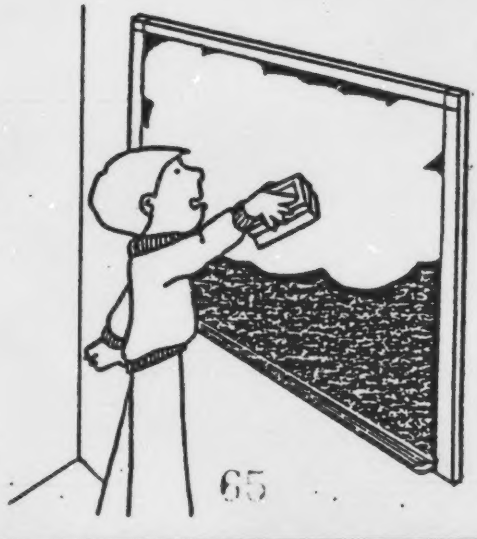
GET THE NECESSARY EQUIPMENT FOR "BREAKING IN" A NEW CHALKBOARD AND GO TO YOUR JOB AREA.



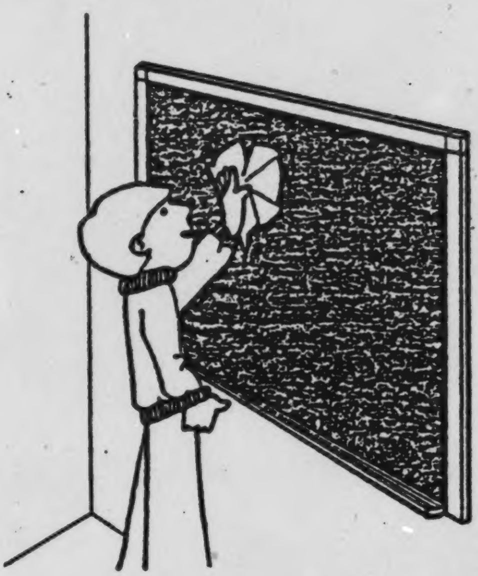
2. USING THE SIDE OF A PIECE OF CHALK, COVER THE WHOLE SURFACE OF THE BOARD WITH CHALK.



3. USING THE ERASER, MAKE CIRCULAR MOTIONS RUBBING THE CHALK INTO THE WHOLE SURFACE OF THE BOARD.

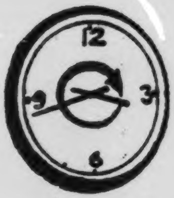


4. USING THE CHAMOIS OR COTTON CLOTH, RUB THE WHOLE SURFACE OF THE CHALKBOARD.

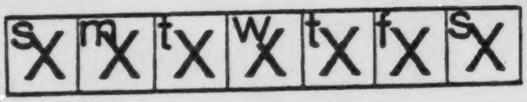


5. DO STEPS 2, 3, AND 4 OVER.

6. WHEN "BREAKING IN" A CHALKBOARD, DO NOT LEAVE THE CHALK ON THE SURFACE OF THE BOARD OVER NIGHT.



7. DO NOT WASH THE CHALKBOARD FOR AT LEAST A WEEK.



8. RETURN ALL EQUIPMENT. BE SURE IT IS CLEANED.

Format for Combination RV/LR Graphics Module - use block type -- 18 point size

Cover Page

Module #
Skill Title

Performance Objective Page

You are going to learn:
In order to do this you will need:
We will know you can do it when:

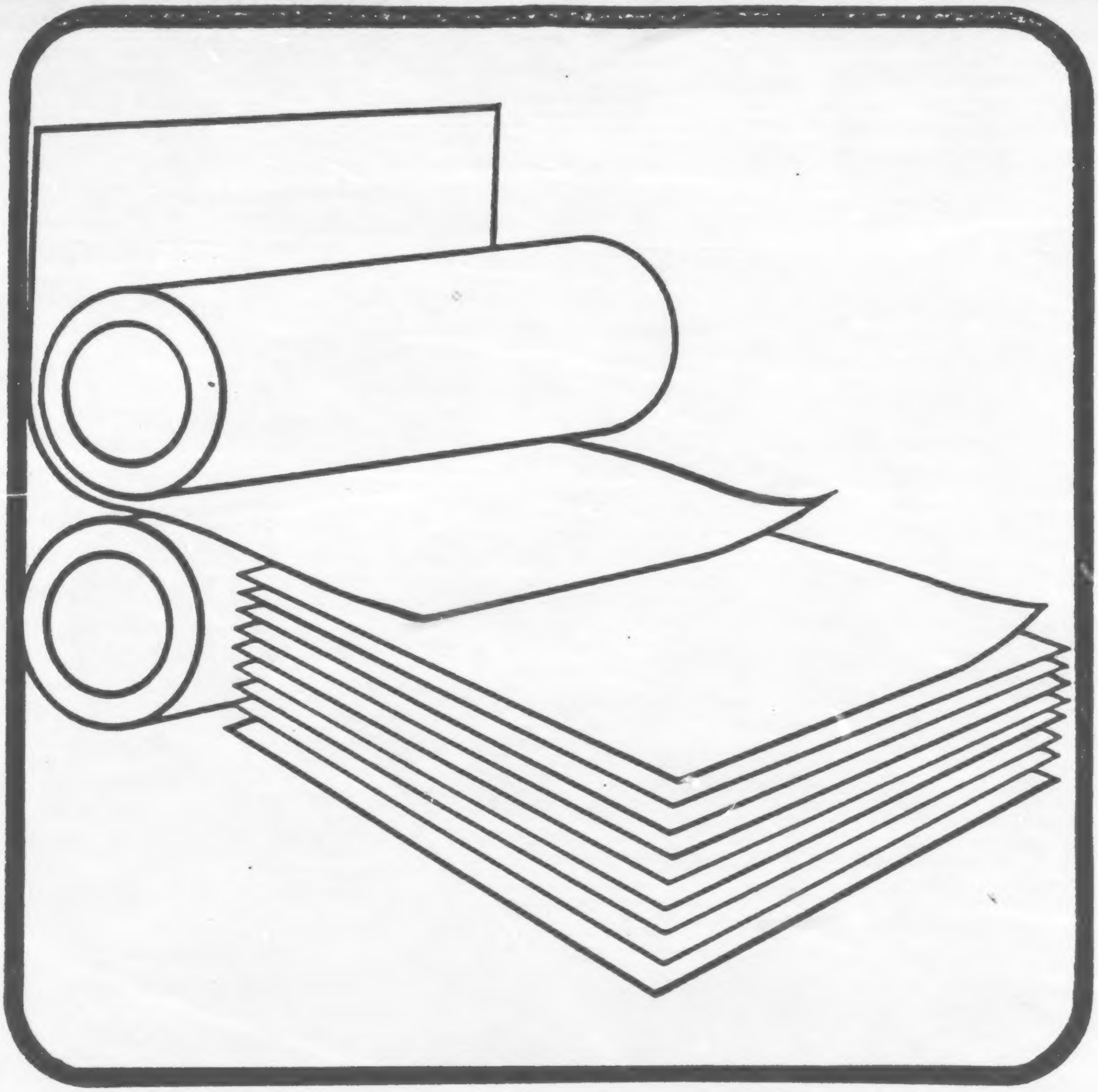
Information Pages

A. Tell why they are learning it.
B. Tell them how to proceed or what they are going to do:
  - watch a slide/tape
  - gather equipment

Job Steps Pages

A. Detail job steps jecessary to do the task including visuals.
B. Extensive use of visuals to accommodate needs of LR student.
C. Define technical words as you go.

See example on following pages of Combination RV/LR Graphics Module



graphics

unit: FINISHING AND BINDERY

capital area career center

module: 1401 14 002
1401 14 002 3 **date:** MARCH 1977 **level:** I

skill title: PAPER AND PRINTED MATERIAL HANDLING, JOGGING AND STACKING

developed & written by: GLEN PETTIT

visuals by: MISCELLANEOUS

WORD GUIDE

JOG - BEND AND SHAKE A LIFT OF PAPER TO GET IT STRAIGHT AND NEAT

PAD COUNTER - HAND-HELD TOOL USED TO COUNT PILES OF PAPER

STACKING - ARRANGING LIFTS (SHEETS) IN A STRAIGHT, UNIFORM, NEAT PILE OR STACK)

LIFT - PILE OF SHEETS THAT IS EASY TO HANDLE AND CARRY. A LIFT HAS A KNOWN AMOUNT OF SHEETS TO IT

STAGGER - MOVE BACK AND FORTH SO EDGES ARE EASIER TO GRAB

PERFORMANCE OBJECTIVE

YOU ARE GOING TO LEARN:

HOW TO OPEN, IDENTIFY, HANDLE AND CARRY PAPER.
HOW TO "JOG" PAPER AND STACK IT IN PILES.

IN ORDER TO DO THIS YOU WILL NEED:

A 1/2 METER (5,000 SHEETS) OF PAPER
AN AUTOMATIC JOGGER (AND AT LEAST AN HOUR OF PRACTICAL PRODUCTION EXPERIENCES IN THE LAB)
PACKAGE LABELS
PAD COUNTER
SCRAP PAPER 8 1/2 X 11" 20# WHITE BOND
WORK TABLE

WE WILL KNOW YOU CAN DO IT WHEN:

1. YOU CAN HANDLE AND CARRY SMALL (3 1/4" X 5 1/2") AND LARGE (23 X 35") SHEETS OF PAPER
2. YOU CAN JOG BY HAND OR WITH AN AUTOMATIC JOGGER.
3. YOU CAN STACK PAPER IN STAGGERED LIFTS OVER 1/2 METER HIGH SO THEY ARE STRAIGHT, UNIFORM, NEAT AND MEET TRADE STANDARDS.
4. YOU CAN IDENTIFY, CARRY AND OPEN SMALL PACKAGES OR LARGE CARTONS OF PAPER.
5. YOU CAN CHECK: SIZE, COLOR, COUNT, WEIGHT, SUBSTANCE KIND AND SIZE, ALL WITH 100% ACCURACY.

A TAPE OF THIS MODULE IS AVAILABLE.

WORD GUIDE

ESSENTIAL - VERY IMPORTANT

INFORMATION

HANDLING, JOGGING AND STACKING PAPER IS CONSIDERED ESSENTIAL BY THE INDUSTRY. THE MAJOR COMPLAINT EMPLOYERS HAVE ABOUT BEGINNING EMPLOYEES (ENTRY LEVEL CAREER CENTER STUDENTS LIKE YOU) IS THAT THEY CANNOT HANDLE, JOG, OR STACK PAPER PROPERLY, ACCORDING TO TRADE STANDARDS. SO, IT IS VERY IMPORTANT THAT YOU LEARN THIS SKILL TO BE SUCCESSFUL IN YOUR JOB.

WORD GUIDE

DISORDERED - LOOSE, OUT OF ORDER, NOT NEAT

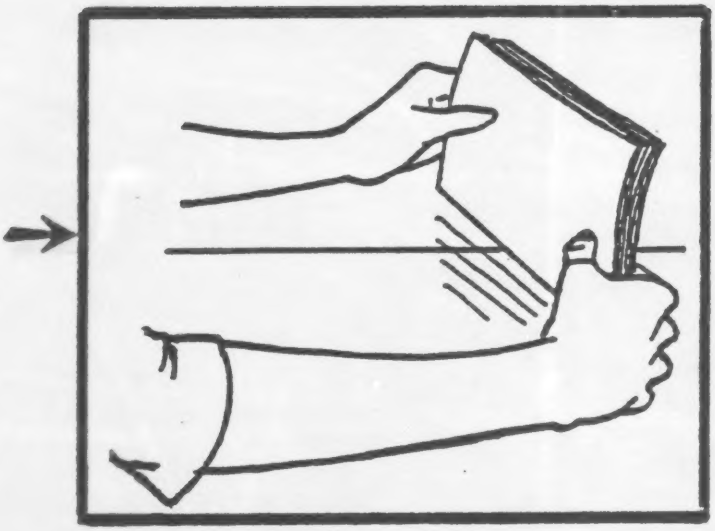
JOB STEPS

1. TAKE ALL EQUIPMENT AND MATERIALS TO YOUR WORK AREA.

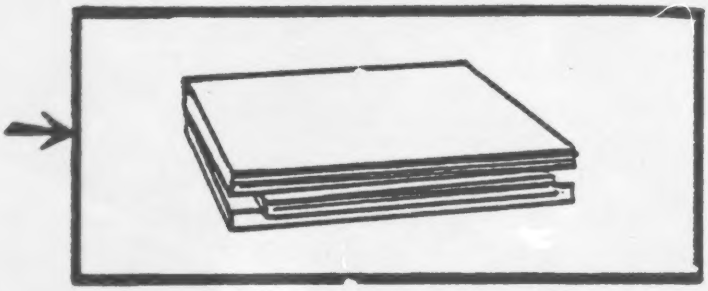
2. FIND THE SCRAP (8 1/2 X 11" 20# WHITE BOND) PAPER BOX IN THE LAB AREA. YOU'LL NEED AN ENTIRE CARTON (5,000 OR 1/2 METER) OF PAPER. YOU WILL ALSO NEED AN ENTIRE TABLE TO WORK ON (1/2 X 1 1/2 METER).

3. MEASURE A LIFT OF PAPER, 5 CM. THICK AND WORK WITH THIS AMOUNT.
    A. JOG THE LIFT BY HAND AS SHOWN IN THE SLIDE/TAPE
    B. START WITH A MESSY LIFT.

    NOTE: THE AVERAGE LIFT SHOULD TAKE 30 SECONDS TO JOG AND STACK. IF YOU ARE HAVING ANY TROUBLE, ASK ANY EXPERIENCED STUDENT TO HELP. DO NOT USE THE AUTOMATIC JOGGER AT THIS TIME.



4. WHEN YOU UNDERSTAND WHAT TO DO, JOG THE ENTIRE CARTON OF PAPER IN LIFTS OF 5 CM. AND STACK ALL LIFTS IN ONE PILE, STAGGERED. YOU SHOULD HAVE AT LEAST TEN LIFTS IN YOUR STACK.

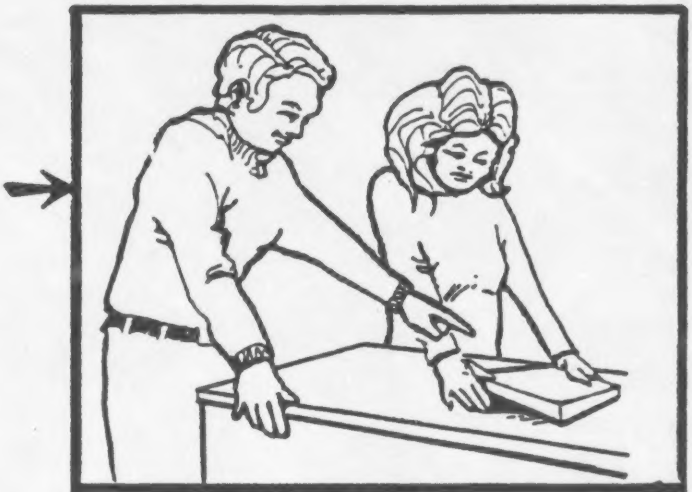


5. WHEN YOU ARE SATISFIED WITH YOUR WORK, HAVE THE INSTRUCTOR CHECK YOUR STACKING.

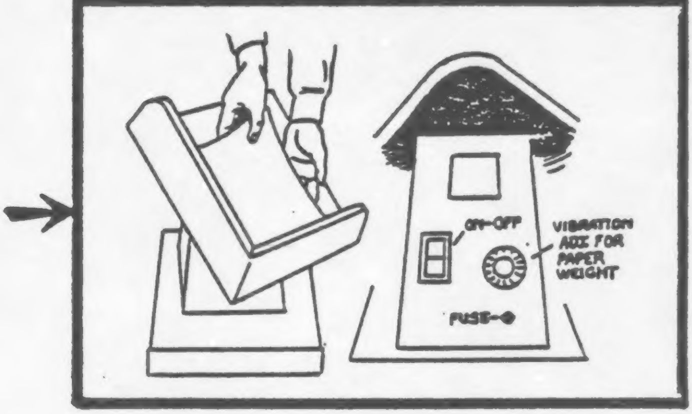
6. ASK THE INSTRUCTOR/MANAGER FOR SOME LARGE 23 X 35" SHEETS TO JOG. HE/SHE WILL HELP AND WATCH YOU HANDLE, JOG, AND STACK THESE LARGE SHEETS.

JOB STEPS

7. ASK THE INSTRUCTOR/MANAGER FOR SOME PACKAGE LABELS. HE/SHE WILL ASK YOU TO IDENTIFY SOME INFORMATION ON THE LABELS: SIZE, COLOR, COUNT, WEIGHT, SUBSTANCE, KIND, AND SIZE.



8. USE THE SAME SCRAP PAPER FROM STEP 3 AND JOG IT IN LIFTS 3 CM. THICK ON THE AUTOMATIC JOGGER (USE THE PAD COUNTER TO COUNT). STACK THESE LIFTS IN ONE PILE, STAGGERED.


ON-OFF
VIBRATION ADJ FOR PAPER WEIGHT
FUSE

9. HAVE THE INSTRUCTOR/MANAGER MAKE A FINAL CHECK ON YOUR WORK.

10. WHEN ACCEPTED, NEATLY RETURN ALL YOUR SCRAP PAPER TO THE SCRAP PAPER BOX (BLANK SIDE UP) AND CLEAN YOUR WORK AREA. REQUEST CREDIT FOR THIS MOD.

NOTE: DURING YOUR TRAINING HERE, YOU WILL HAVE THE OPPORTUNITY TO WORK ON PRODUCTION. IN ADDITION TO THE BASIC PRACTICE YOU HAVE JUST DONE, YOU SHOULD DO AT LEAST ONE HOUR OF PRODUCTION HANDLING, JOGGING, STACKING, AND WORKING WITH PAPER. YOU MAY SPEND FIVE MINUTES EACH ON A DOZEN JOBS, BUT IT IS IMPORTANT YOU LEARN AND REMEMBER THIS SKILL BECAUSE IT IS A VERY BASIC ENTRY-LEVEL SKILL.

Format for Combination LR/EMI Small Engine Repair Module

Performance Objective Page

You are going to learn:
And in order to do this you will need:
We will know you can do it when:

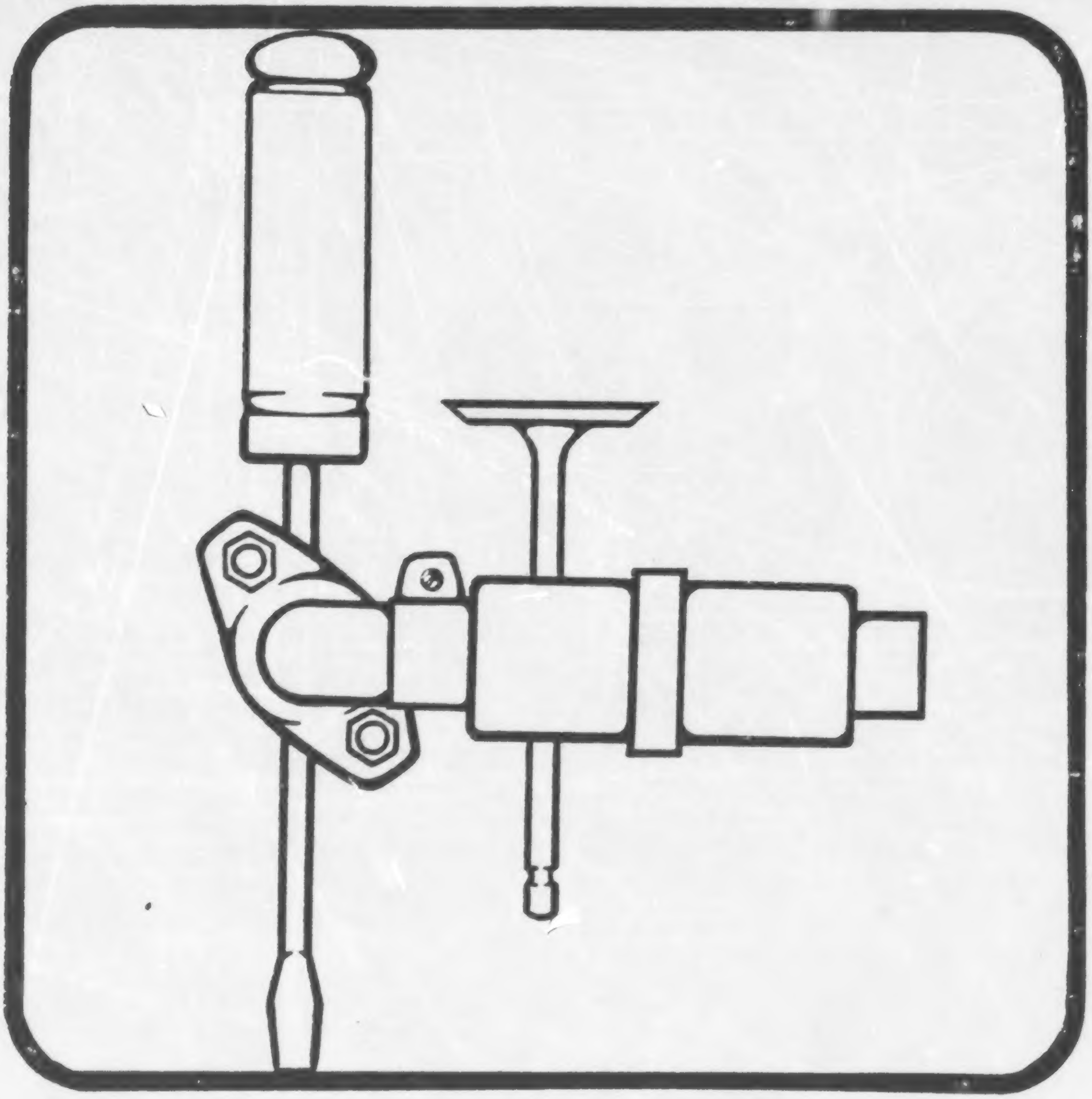
Information Pages

A. Only includes special knowledges that cannot be incorporated in job steps.
B. Tells reader how to proceed if there is special equipment or visual aids, i.e. slide/tape.

Job Step Pages

A. Detail job steps necessary to do the task.
B. Written at the third grade level.
C. Check written after three or four job steps.
D. Define technical words in context.

See example on following pages of Combination LR/EMI Small Engine Repair Module



small engine repair

unit: GEAR BOXES AND DRIVE TRAINS

capital area career center

module: 7501 10 001 1
7501 10 001 3 date: MARCH 1978 level: I

skill title: REMOVE AND REPLACE TRANSAXLE JOHN DEERE TRACTOR (200 SERIES)

developed & written by: JACK HELDER

visuals by: DAVE WEHRWEIN & BRUCE BENNETT

WORD GUIDE

TRANSAXLE - A UNIT CONSISTING OF A TRANSMISSION AND A DIFFERENTIAL AXLE.

PERFORMANCE OBJECTIVE

YOU ARE GOING TO LEARN:

HOW TO REMOVE AND REPLACE THE TRANSAXLE ON A JOHN DEERE 200 SERIES TRACTOR.

IN ORDER TO DO THIS YOU WILL NEED:

JOHN DEERE TRACTOR, 200 SERIES
1 SOCKET SET
1 OPEN END WRENCH SET
1 BOX END WRENCH SET
1 PLIERS
AUTOMOTIVE JACK
BLOCKS OR HOLDING FRAME
SAFETY GLASSES

WE WILL KNOW YOU CAN DO IT WHEN:

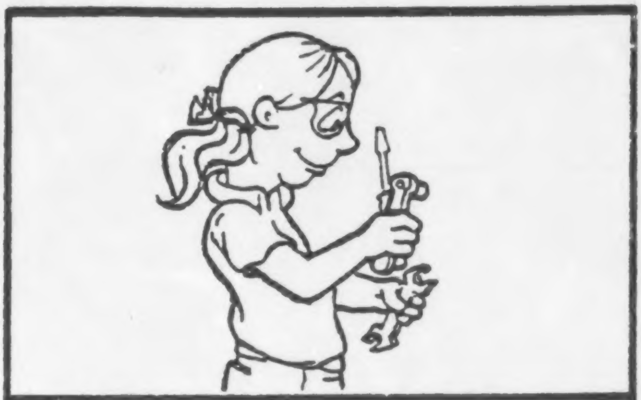
1. YOU HAVE COLLECTED ALL EQUIPMENT.
2. YOU HAVE REMOVED TRANSAXLE AND OTHER PARTS ACCORDING TO JOB STEPS.
3. YOU HAVE REPLACED TRANSAXLE AND ALL PARTS SO THAT TRACTOR RUNS AS IT SHOULD.

"TURN THE PAGE"

JOB STEPS

READ: LOOK:

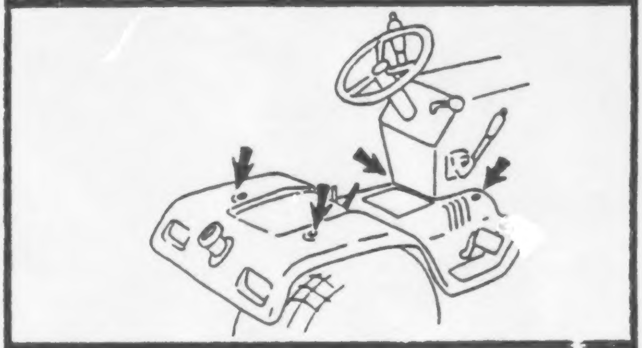
1. TAKE YOUR EQUIPMENT AND THE TRACTOR TO YOUR WORK AREA. →



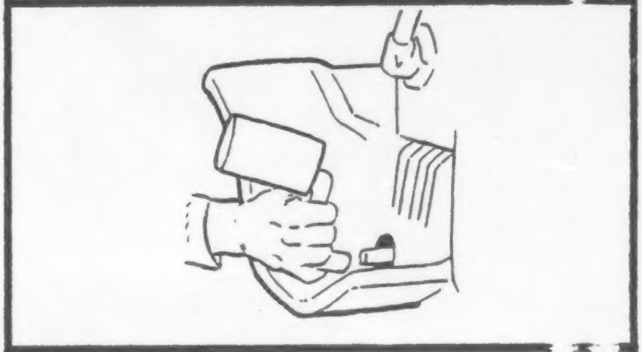
CAUTION: PUT ON YOUR SAFETY GLASSES.

2. TO REMOVE FENDER DECK, FOLLOW STEPS A-H BELOW.

A. REMOVE 4 BOLTS - 2 IN FRONT, 2 IN BACK. →



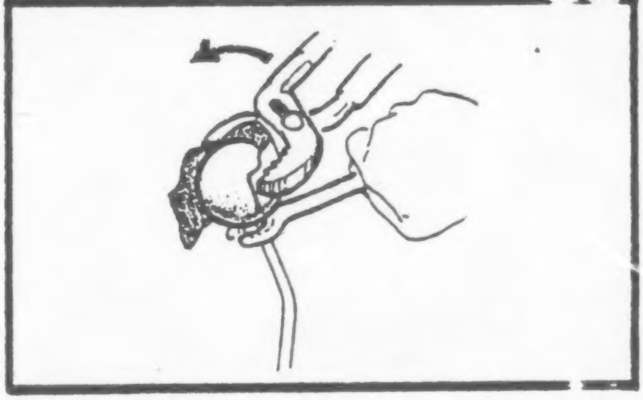
B. REMOVE 2 FOOT PEDALS. →



C. UNSCREW THE HANDLE TOPS:

1) PROTECT KNOB WITH A RAG AND LOOSEN WITH PLIERS.

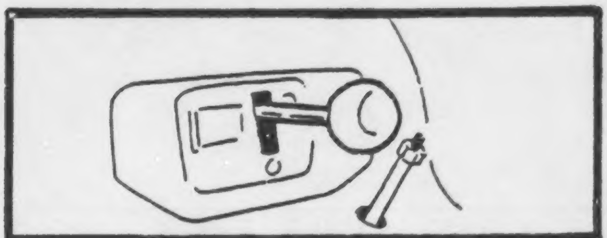
2) HOLD HANDLE NUT WITH A WRENCH. →



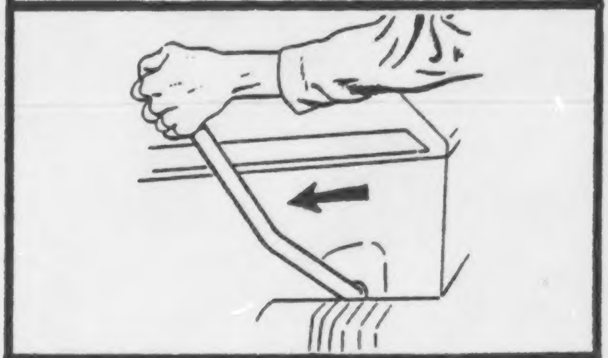
JOB STEPS

READ: LOOK:

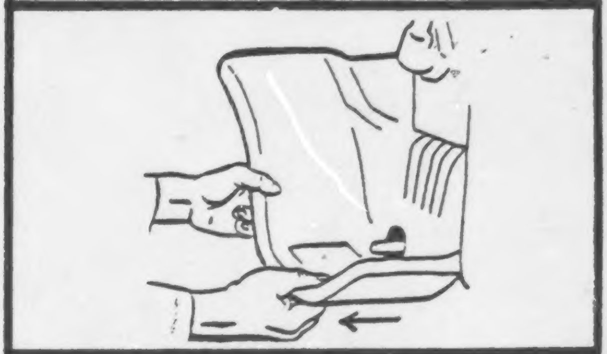
D. PUT GEAR SHIFT IN NEUTRAL.



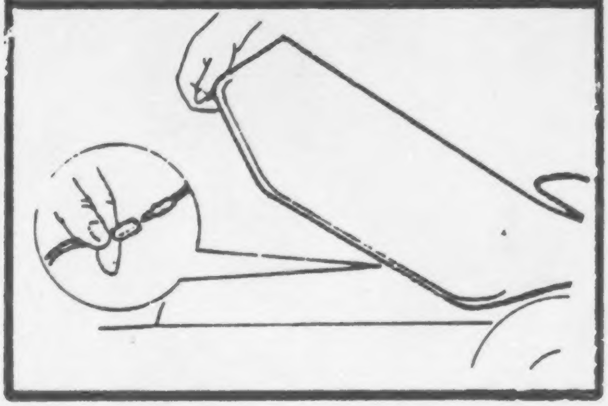
E. DROP BLADE (HANDLE ON LEFT SIDE).



F. HAVE SOMEONE HOLD UP FENDER DECK BY PULLING OUT ON PEDAL HOLDERS.



G. WHILE DECK IS HELD UP, REMOVE ELECTRIC WIRE TO SEAT SENSOR.



H. PULL THE FENDER DECK BACKWARD. DON'T LOSE THE BLACK SPACER ON THE FRONT LEFT SIDE.

CHECK: HAVE YOUR INSTRUCTOR CHECK THAT YOU HAVE:

1. REMOVED THE 4 BOLTS.
2. REMOVED FOOT PEDALS.
3. TAKEN OFF THE HANDLE TOP WITHOUT SCRATCHING KNOB.
4. REMOVED SEAT SENSOR WIRE.
5. PULLED BACK THE FENDER DECK WITHOUT LOSING THE BLACK SPACER.

"TURN THE PAGE"

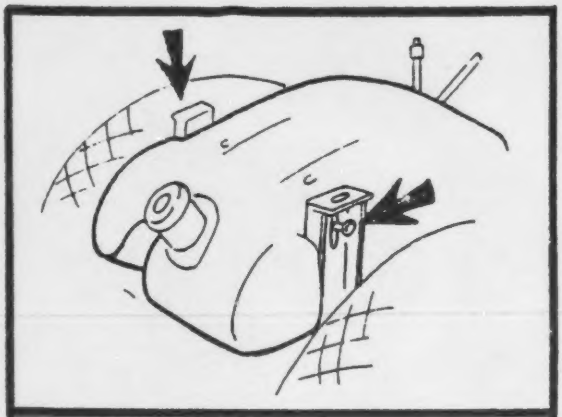
JOB STEPS

READ:

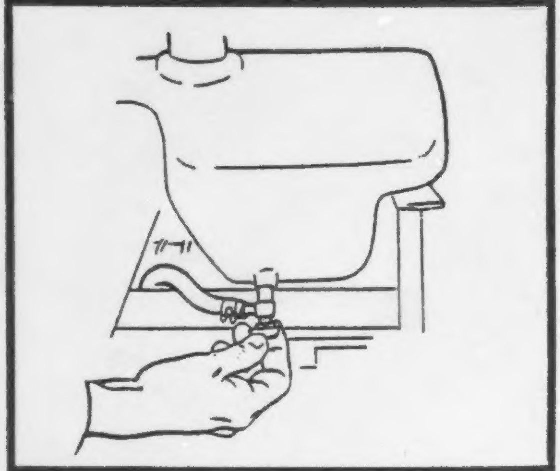
LOOK:

3. NOW FOLLOW THE STEPS BELOW (A-F) TO REMOVE AND DRAIN THE GAS TANK.

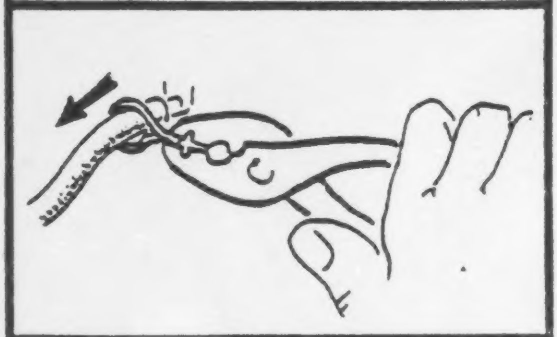
A. REMOVE 2 BOLTS ON SIDE OF TANK.



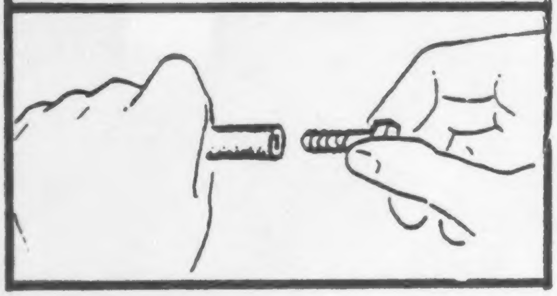
B. TWIST VALVE UNDER THE TANK TO THE LEFT. THIS SHUTS OFF GAS.



C. USE PLIERS TO REMOVE GAS LINE CLAMP.



D. PLUG THE GAS LINE WITH A BOLT.



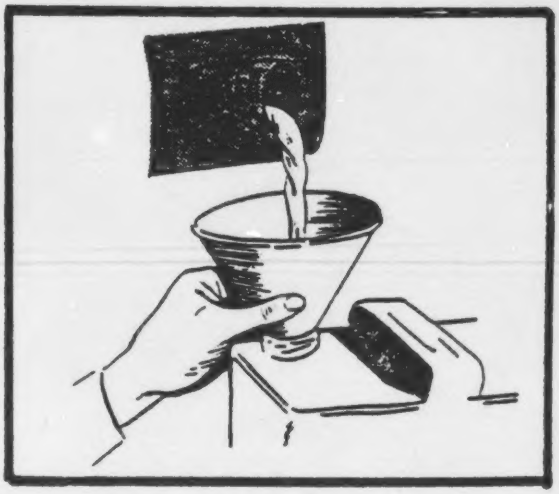
E. NOTICE WHERE GAS LINE IS PLACED OVER THE TRANSMISSION. YOU MUST REMEMBER TO PUT IT BACK LATER.

"TURN THE PAGE"

JOB STEPS

READ: LOOK:

F. PUT GAS FROM TANK INTO A SAFE CONTAINER. →

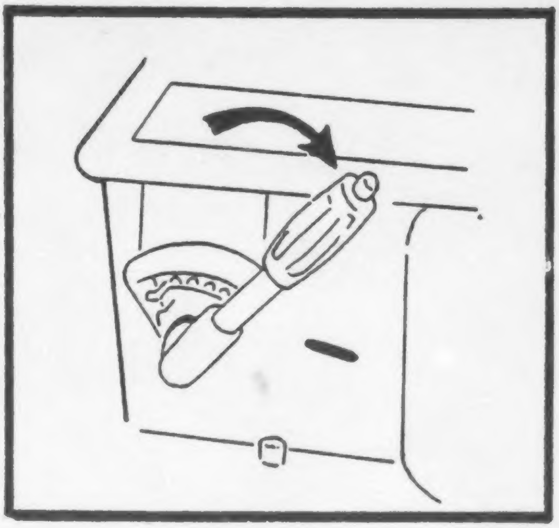


CHECK: ASK YOUR INSTRUCTOR TO CHECK THAT YOU HAVE:

1. REMOVED GAS TANK.
2. SHUT OFF GAS VALVE.
3. REMOVED GAS LINE CLAMP.
4. PLUGGED GAS LINE WITH A BOLT.
5. LEARNED WHERE GAS LINE GOES OVER THE TRANSMISSION.
6. EMPTIED GAS TANK IN A SAFE CONTAINER.

4. FOLLOW THESE STEPS (A-C) TO REMOVE SECONDARY BELT:

A. START THE ENGINE AND MOVE VARIABLE SPEED CONTROL TO FORWARD. →



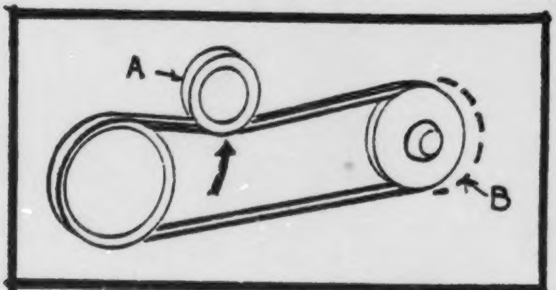
CAUTION: BE SURE GEAR IS IN NEUTRAL.

"TURN THE PAGE"

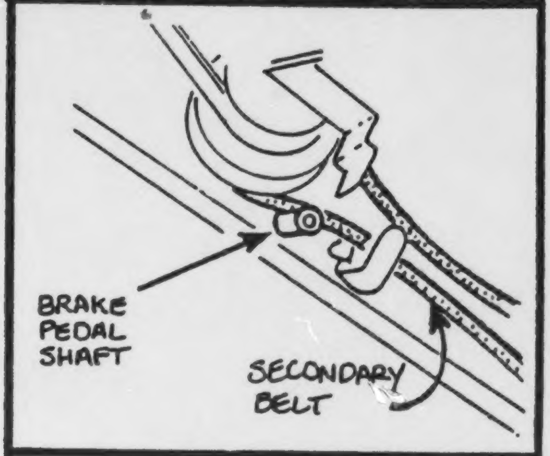
JOB STEPS

READ: LOOK:

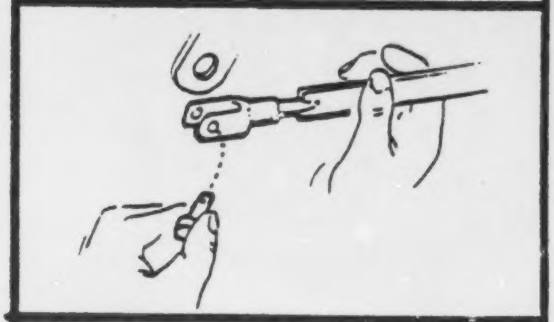
B. RAISE THE SECONDARY BELT IDLER (A) AND SLIP SECONDARY BELT (B) OFF IDLER.



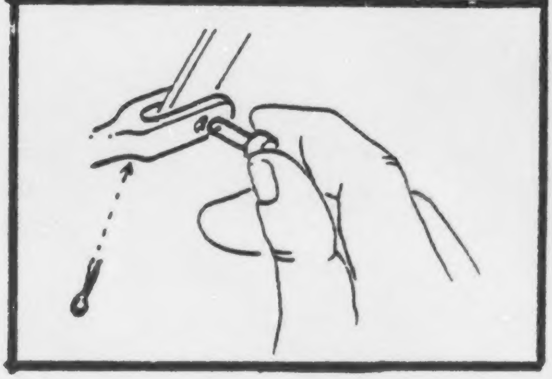
C. PUSH IN CLUTCH SO YOU CAN PULL SECONDARY BELT PAST THE BRAKE PEDAL SHAFT. TURN OFF ENGINE.


BRAKE PEDAL SHAFT
SECONDARY BELT

5. REMOVE COTTER PIN AND DRILLED PIN FROM BRAKE ARM.



6. REMOVE COTTER PIN FROM BRAKE PEDAL LINKAGE TO CROSS SHAFT.



"TURN THE PAGE"

JOB STEPS

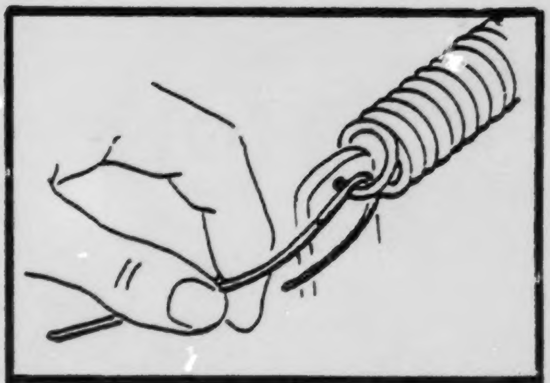
READ: LOOK:

CHECK: ASK YOUR INSTRUCTOR TO CHECK THAT YOU HAVE:

1. REMOVED SECONDARY BELT.
2. SHUT OFF ENGINE.
3. REMOVED COTTER PIN AND DRILLED PIN FROM BRAKE ARM.
4. REMOVED COTTER PIN FROM BRAKE PEDAL LINKAGE TO CROSS SHAFT.

7. HAVE YOUR INSTRUCTOR HELP YOU REMOVE IDLER PULLEY TENSION SPRING BY FOLLOWING THESE STEPS (A-B):

A. HOOK STIFF WIRE TO SPRING END SO YOU CAN LET IT BACK EASY AND KEEP HOOK ON BRACKET.

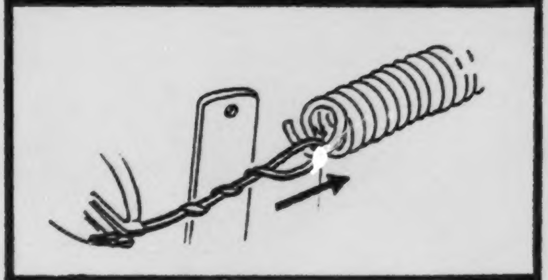


****

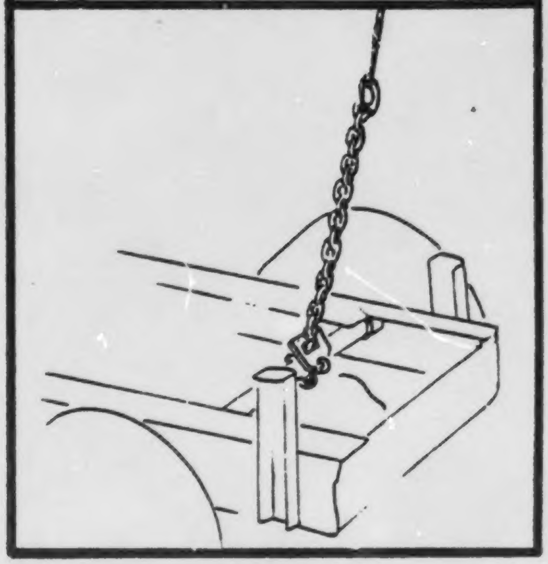
CAUTION: DON'T LET SPRING FLY AWAY. IT CAN HURT.

****

B. USE VICE GRIPS TO SLOWLY LET BACK THE SPRING UNTIL TENSION IS RELEASED.



8. USE A HOIST TO SUPPORT THE BACK END. PUT CHAIN ON THE CROSS SHAFT.



"TURN THE PAGE"

JOB STEPS

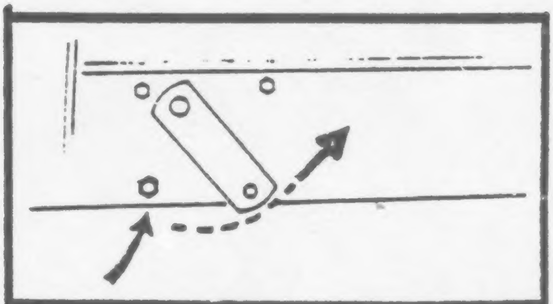
READ: LOOK:

CHECK: ASK YOUR INSTRUCTOR TO CHECK THAT YOU HAVE:

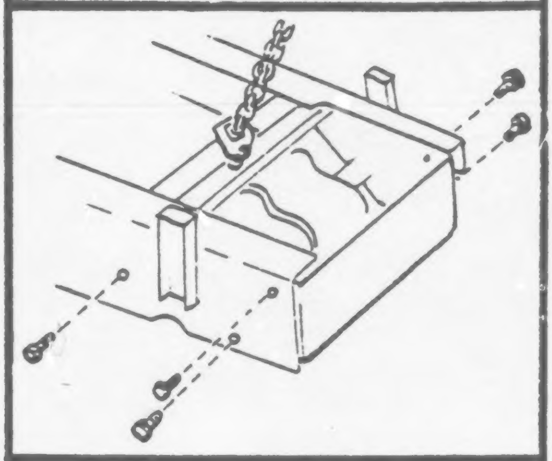
1. RELEASED SPRING TENSION.
2. PUT HOIST CHAIN ON CROSS SHAFT TO SUPPORT BACK END OF TRACTOR.

9. TO REMOVE THE 6 BOLTS FROM THE TRANSAXLE TO THE TRANSMISSION, FOLLOW STEPS A-E BELOW:

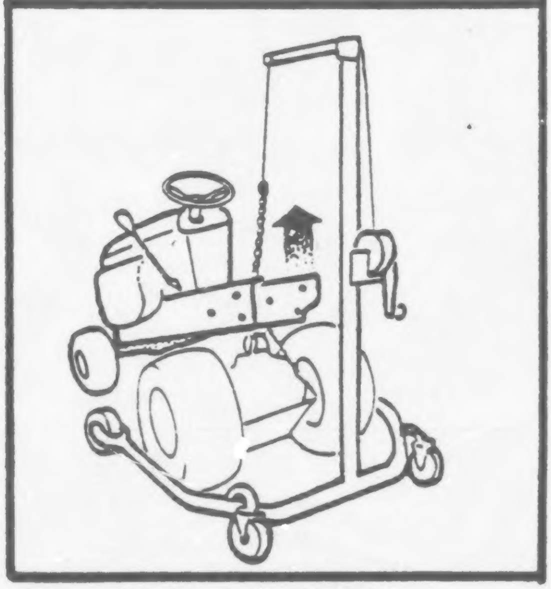
A. PUSH BRAKE ARM FORWARD TO REMOVE ONE RIGHT SIDE BOLT.



B. REMOVE OTHER BOLTS.



C. USE HOIST TO RAISE FRAME ABOVE TRANSAXLE.



D. PUT BLOCKS UNDER CUTTING UNIT, THEN UNHOOK HOIST AND PULL AWAY.

E. SHIFT INTO NEUTRAL AND WHEEL AWAY THE TRANSAXLE.

"TURN THE PAGE"

JOB STEPS

READD: LOOK:

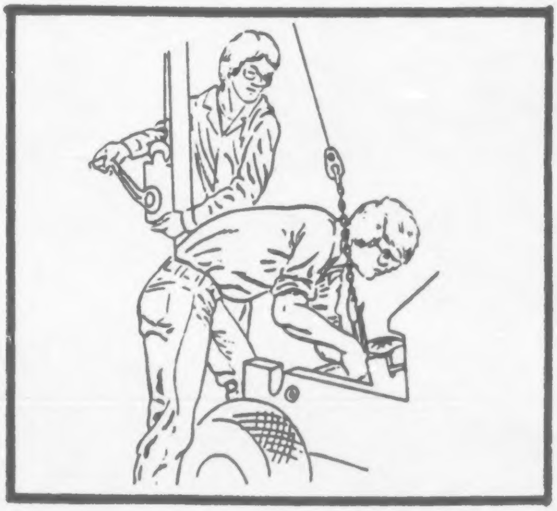
CHECK: ASK YOUR INSTRUCTOR TO:

1. CHECK THAT YOU HAVE REMOVED THE TRANSAXLE SAFELY AND COMPLETELY.
2. DECIDE WHAT REPAIRS, IF ANY, MUST BE DONE BEFORE YOU REPLACE THE TRANSAXLE.

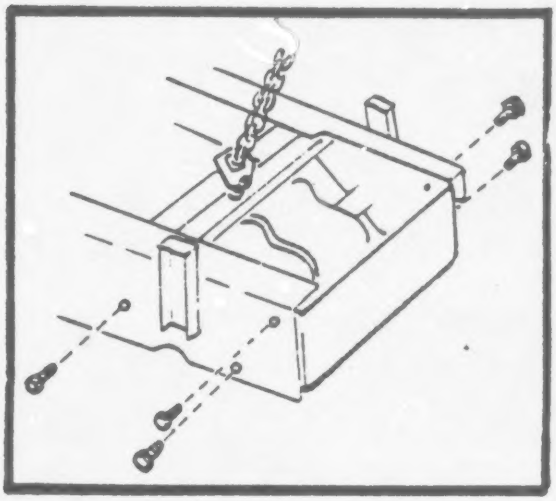
10. TO REPLACE THE TRANSAXLE;

A. GET SOME HELP TO GUIDE SHIFT LEVER INTO THE SLOT. →

B. THEN PUSH THE TRANSAXLE BACK UNDER THE FRAME. →



11. REPLACE THE 6 BOLTS. →



CHECK: ASK YOUR INSTRUCTOR TO CHECK THAT YOU HAVE:

1. REPLACED TRANSAXLE UNDER FRAME.
2. REPLACED THE 6 BOLTS.

"TURN THE PAGE"

WORD GUIDE

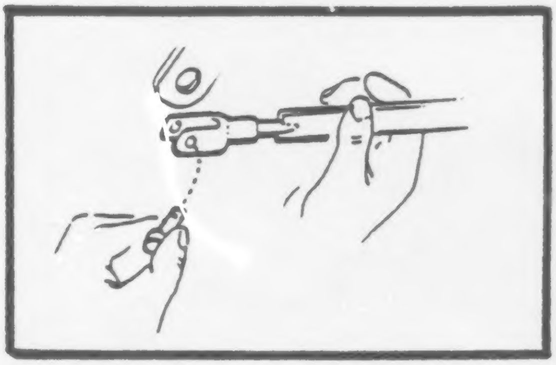
VARIATOR - A PULLEY WITH AN ADJUSTABLE SHEAVE FOR SPEED CONTROL.

SHEAVE - GROOVED WHEEL.

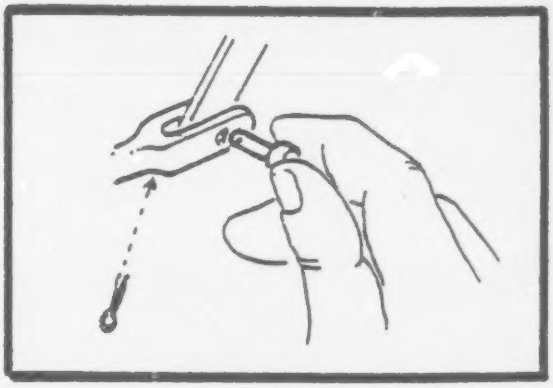
JOB STEPS

READ: LOOK:

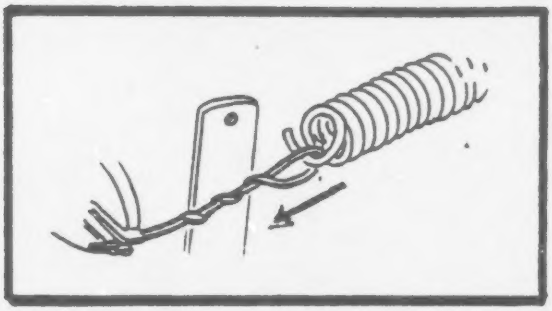
12. REPLACE PIN IN THE BRAKE ARM.



13. REPLACE THE COTTER PIN WHERE THE BRAKE PEDAL LINKAGE MEETS THE CROSS SHAFT.



14. CHECK THAT VARIATOR CONTROL IS IN "FAST" POSITION. THEN CONNECT IDLER SPRING.



NOTE: REMEMBER TO USE WIRE AND VICE GRIPS AS IN STEP 7.

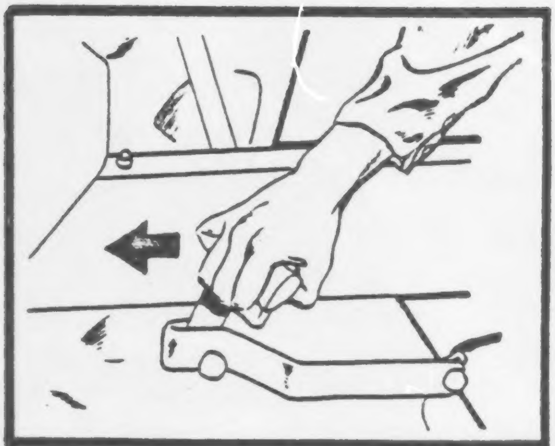
"TURN THE PAGE"

JOB STEPS

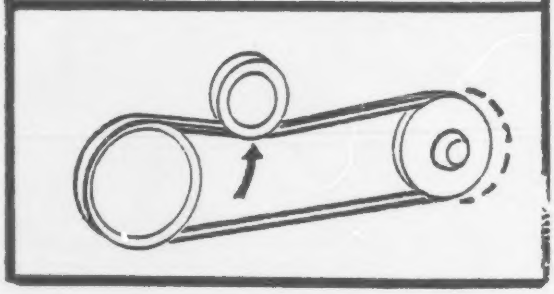
READ: LOOK:

15. REPLACE BELT ON VARIATOR SHEAVE FOLLOWING STEPS "A" AND "B".

A. DEPRESS CLUTCH PEDAL.



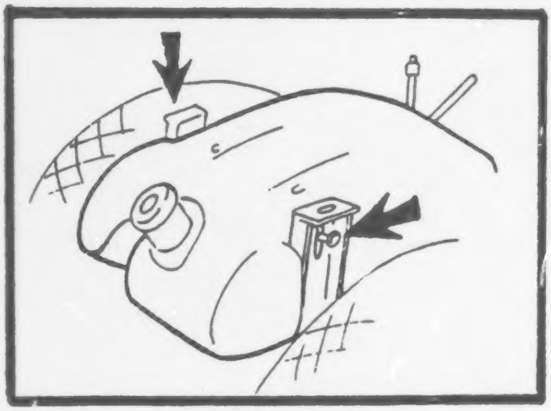
B. RAISE SECONDARY BELT IDLER AND INSTALL BELT ON TRANSMISSION-DRIVEN SHEAVE.



CHECK: ASK YOUR INSTRUCTOR TO CHECK THAT YOU HAVE:

1. REPLACED PIN IN BRAKE ARM.
2. REPLACED COTTER PIN BETWEEN BRAKE PEDAL LINKAGE AND CROSS SHAFT.
3. CONNECTED IDLER SPRING.
4. REPLACED BELT ON VARIATOR SHEAVE.

16. INSTALL FUEL TANK AND PUT FUEL IN.



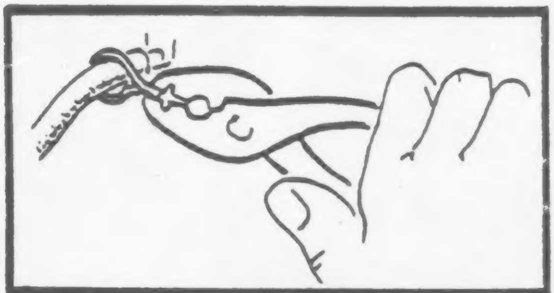
"TURN THE PAGE"

JOB STEPS

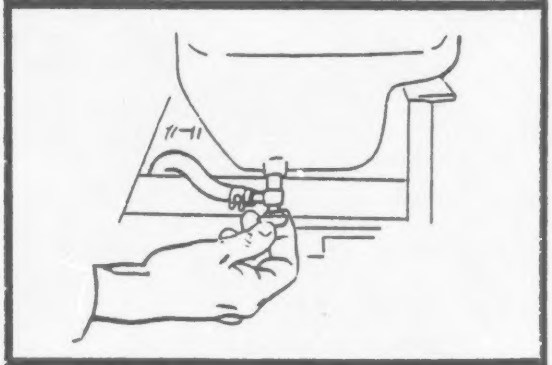
READ:

LOOK:

17. PUT GAS LINE IN ON THE SAME PLACE AS YOU TOOK IT OUT.



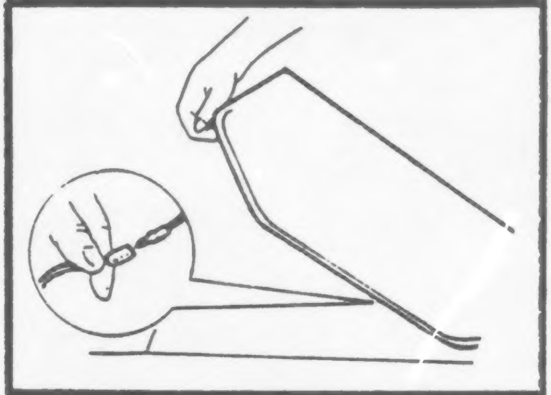
18. TURN ON FUEL VALVE.



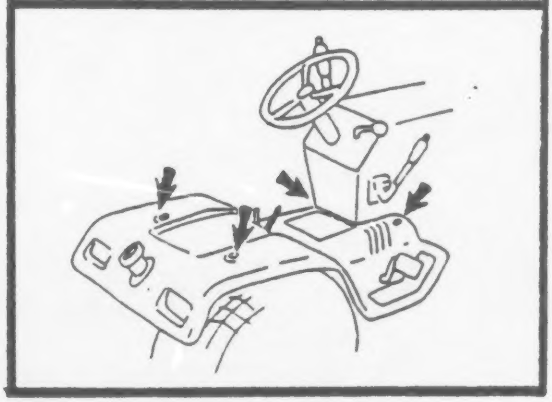
19. TO REPLACE FENDER DECK, FOLLOW STEPS A-E BELOW.

A. HAVE SOMEONE HELP YOU PUT IT ON THE SAME WAY YOU TOOK IT OFF.

B. BE SURE TO PLUG IN THE SEAT SENSOR.



C. REPLACE THE 4 BOLTS. BE SURE TO PUT THE BLACK SPACER ON THE RIGHT BOLT.

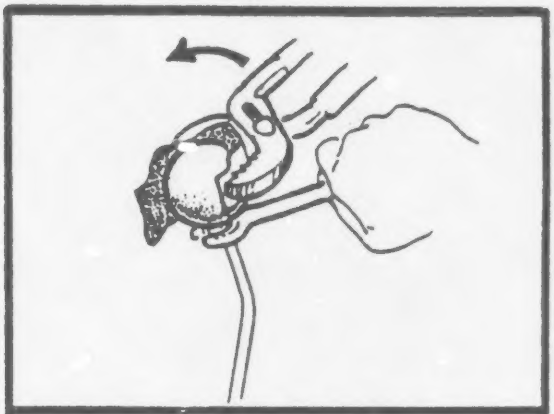


"TURN THE PAGE"

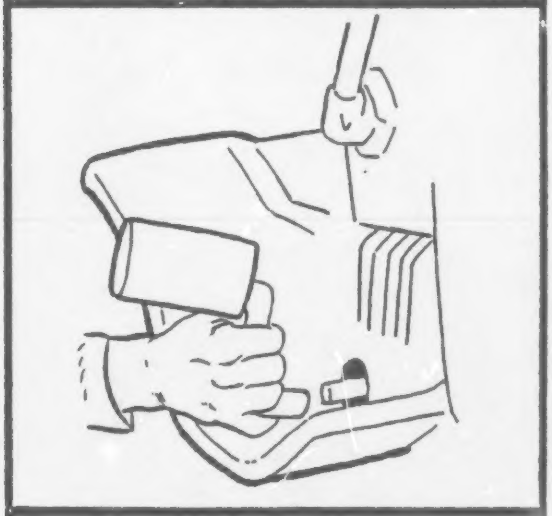
JOB STEPS

READ: LOOK:

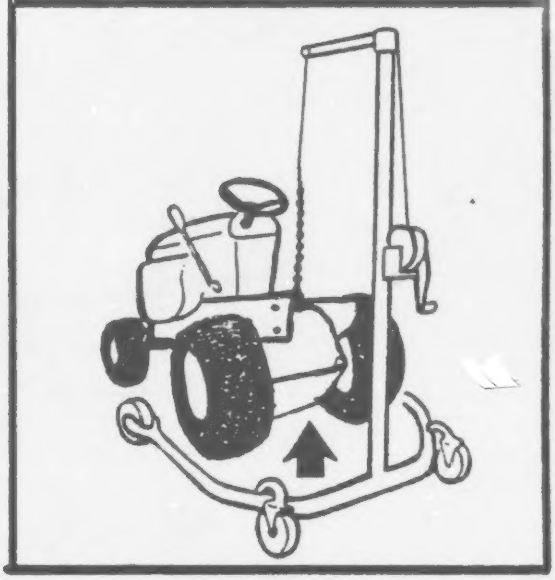
D. REPLACE THE SHIFT HANDLE. →



E. REPLACE THE 2 FOOT PEDALS. →



20. USE HOIST TO LIFT REAR WHEELS SLIGHTLY OFF THE FLOOR. →

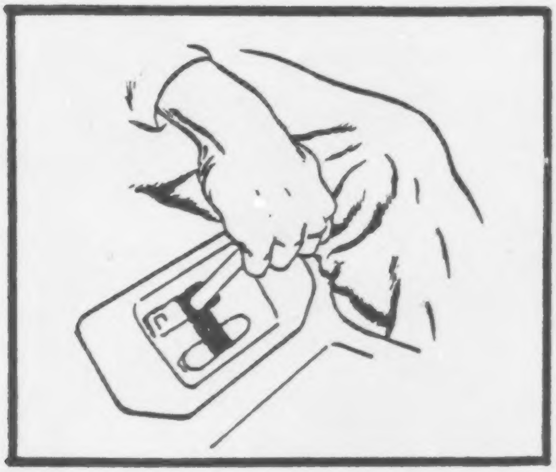


"TURN THE PAGE"

JOB STEPS

READ: LOOK:

21. START THE TRACTOR AND SHIFT IT INTO GEAR. ➔



CHECK: ASK YOUR INSTRUCTOR TO CHECK THAT YOU HAVE:

1. INSTALLED GAS TANK AND PUT GAS IN.
2. PUT GAS LINE AND SEAT SENSOR WIRE IN RIGHT PLACE.
3. TURNED ON FUEL VALVE.
4. REPLACED FENDER DECK, SHIFT HANDLE AND FOOT PEDALS.
5. LIFTED REAR WITH HOIST AND TESTED THAT ENGINE GOES INTO GEAR.

22. PUT AWAY ALL TOOLS AND CLEAN UP YOUR WORK AREA.

Slide Tapes

Slide tapes were developed for each of the occupational areas. General considerations for the slide tapes included:

1. the process involved more than one skill;
2. involved a complicated machine; and
3. safety factors needed to be emphasized.

In all slide tapes, the safety hints were illustrated. The slide tapes were designed for the Regular Vocational Student. The other groups could utilize the slide tapes, but the frequency of viewing would differ. For the EMI it was recommended in the field test results that the slide tapes be viewed two or three times for the student to gain the information.

CHAPTER V

Identification of Environmental Barriers for the Physically Impaired

This part of the project was combined with another State of Michigan funded project to design a comprehensive assessment and adaptation procedure to aid the physically impaired in the vocational setting. The project was developed to provide the following:

1. An analysis of the actual physical requirements of five occupational areas.
2. A systematic method by which to assess a person's physical skills in relation to the occupational areas.
3. A set of general guidelines on adapting the learning station, the work station, and/or the person so that a handicapped individual could participate fully in the regular vocational training programs and in the world of work.

A review of the literature, which included an ERIC and Medline Search, indicated that while some job and personal analysis forms had been developed, there had been neither systematic analysis of the physical requirements of various occupations, nor a systematic job-oriented way of assessing an individual's physical abilities. In addition, there was no literature available other than that on architectural barriers in building, on how to modify/adapt work/learning environments. Thus, the project was charged with meeting the following goals:

1. Develop an occupational physical analysis form and system for analyzing the physical requirements of various occupational areas.
2. Develop a system and form by which to analyze the physical skills of individuals in relation to those occupations.
3. Develop a set of adaptation guidelines on modifying and adapting the learning/work site and/or the person so that a handicapped worker could perform the occupational skills.

Goal 1 - Development of Occupational Physical Analysis

A 68 item occupational physical analysis form and procedure was developed (see appendix K). Fifty-two items were physical skills and 16 were working conditions. Each physical skill or working condition was given a code number 1 to 68. On-site learning and work station observations were conducted. For each occupation there were at least two learning station and six work station observations of at least two hours. The jobs were analyzed by observing the worker, the worker's actions and the working conditions and recording this information on an Occupational Analysis Form. Only skills and working conditions actually observed were recorded. In addition, an instructor from each occupational area filled out an Analysis Form. Discrepancies were noted and checked with the vocational advisory committee for each occupational area.

Results of the Occupational Physical Analysis were detailed on an Occupational Physical Profile as shown partially on the next page. Skills are numbered 1 to 68 and these skill numbers are consistent throughout all materials. The profile on the next page is for Small Engine Repair.

OCCUPATIONAL PHYSICAL PROFILE

OCCUPATIONAL AREA SMALL ENGINE

KILL NO.	SKILL	DESCRIPTION
1	Stand--75% of time	Balanced w/o holding on or being held.
2	Sit--25% of time	Balanced w/o holding on or being held.
4	Bend/lean over--freq.	Balanced w/o holding on or being held.
5	Kneel/crouch--occas.	Balanced w/o holding on or being held.
7	Push an object--occas.	Using total body movements.
8	Pull an object--occas.	Using total body movements.
9	Walk--avg. freq., avg. distance	½ hr. to 2½ hrs/day, 11-99 yards.
10	Balance-walking on irregular surface--slippery	
13	Carry objects--100 lbs, 4-10 yds. at a time	
15	Lift from floor--100 lbs.	
16	Lift & move horizontally-50 lbs.	Lift and move, not slide, object horizontally at work level.
18	Reach--up, down, to the side, forward	Out up to an arms length & work with arms.
20	Bend elbow	To bring hands toward body, e.g. using a saw.
21	Turn arm & forearm ½ way	

SKILL NO.	SKILL	DESCRIPTION
22	Turn whole arm all way	
23	Gross grasp	Grasp & hold large object with whole hand.
24	Fine grasp	Grasp & hold sm. object between thumb & fingers.
25	Manipulate objects	Pick up, pinch, squeeze, handle object.
28	Use whole leg	Any activity requiring motion of whole leg, e.g. use leg controls.
30	Apply force with leg	Push with considerable force on object or mechanism with leg(s).
31	Leg touch	Detect & react to variations in pressure as felt thru feet or legs.
32	Gross coordination	Use smooth coordinated motion of whole arm for large scale actions for accuracy/safety.
33	Fine coordination	Use smooth coordinated motion of wrist, hand, & fingers for sm. scale actions for accuracy/safety
36	Eye-hand coordination	Coordinated use of hand(s) w/ what is seen.
38	Non-visual coordination	Know where arm(s)/leg(s) is & how it is moving without seeing.
39	Accurate close vision	Accurate vision at 20" or less.
40	Accurate medium vision	Accurate vision at 20" to 20'.
41	Accurate far vision	Accurate vision at 20' or more.

OCCUPATIONAL PHYSICAL PROFILE

OCCUPATIONAL AREA SMALL ENGINE

page 2

KILL NO.	SKILL	DESCRIPTION
43	Peripheral vision	See an object not in direct line of vision.
44	Accomodation	Ability of eye to adjust to seeing object at different distances.
45	Color vision	Identify & differentiate colors.
47	Hear	Sounds & differentiate between them.
48	Talk	Understand spoken words & use intelligible speech at normal conversational level.
49	Talk above background noise	Selective listening & understanding of speech & loud speaking above background noise.
50	Use telephone	Hearing & understanding what is being said & using understandable speech over phone.
51	Read & write	Communicate thru written words.

SKILL NO.	SKILL	DESCRIPTION
52	Use diagrams/forms	Read, record on, & understand diagrams, graphs, charts, etc.
53	Work inside 75% of time	Protection from weather but not necessarily temp. changes.
61	Work in atmospheric conditions of--Fumes, odors, poor ventilation	Smoky or vaporous exhaust, noxious smells, e.g. ammonia, insufficient movement of air.
62	Work in excessive noise	Enough either constant or intermittent to cause distraction or possible injury to hearing.
64	Work with hazards	Worker is exposed to definite risk of bodily injury, e.g. moving machinery & parts, hot machinery.
66	Share environment but work alone	Share tools, environment, or equipment with others but perform tasks by self.
68	Work schedule--full time	

A second form called the Occupation/Person Comparison Sheet was developed for each occupational area. A sample is shown on the next page. Note that skills are numbered. Each skill has its own number. The example shown is from the Small Engine Repairperson Analysis. The darkened blocks indicate the physical skills required by that occupational area.

Goal 2 - Development of Personal Physical Analysis

A personal physical analysis procedure and form was developed to assess a person's physical skills relative to a particular occupational area. The Personal Physical Analysis consists of two parts:

Tests for Specific Physical Skills
A Physician/Therapist Sheet

Tests for Specific Physical Skills - The first part of the Personal Analysis consists of tests for individual skills. An individual Skill Test for each physical skill analyzed was developed.

Physician/Therapist Sheet - The second part of the analysis is the Physician/Therapist Sheet. Some of the items covered in the analysis could only be measured by qualified professionals such as physicians. These items are listed on a Physician/Therapist Sheet and include things such as the individual's ability to tolerate heat, cold, pollution, etc. This form is sent to the student's physician.

The results of the personal analysis are recorded on the Occupation/Person Comparison form as shown on the next page. The X's indicate the skills the person possesses.

Using the Occupation/Person Comparison form on the next page, the instructor can see how the student's abilities compare with the job requirements. This is vital in placement, training, and learning/work site modifications.

OCCUPATION/PERSON COMPARISON SHEET

OCCUPATIONAL AREA Small Engine Repair **STUDENT NAME**________ **OBSERVER NAME**________ **DATE**________

SKILL NO.	SKILLS	OCCUPATIONAL PHYSICAL PROFILE	PERSONAL PHYSICAL PROFILE	
			w/o adapt.	• w/ adapt.
1.	STAND 75 % OF TIME	▨		
2.	SIT 25 % OF TIME	▨		
3.	LIE FRONT/BACK % OF TIME			
4.	BEND/LEAN OVER	▨		
	frequently			
5.	KNEEL OR CROUCH	▨		
	occasionally			
6.	CRAWL			
7.	PUSH OBJECTS	▨		
	occasionally			
8.	PULL OBJECTS	▨		
	occasionally			
9.	WALK - avg. frequency,	▨		
	avg. distance			
10.	BALANCE-IRREG. SURFACE	▨		
11.	BALANCE-SMALL SPACE			
12.	CLIMB			
13.	CARRY - 100 lbs.,	▨		
	4-10 yds. at a time			
14.	CARRY & BALANCE			
15.	LIFT FROM FLOOR	▨		
	100 lbs.			
16.	LIFT & MOVE HORTIZ.	▨		
	50 lbs.			
17.	LIFT ABOVE SHOULDERS			

* SEE ATTACHED ADAPTATION SHEET (S)

SKILL NO.	SKILLS	OCCUPATIONAL PHYSICAL PROFILE	PERSONAL PHYSICAL PROFILE	
			w/o adapt.	• w/ adapt.
18.	REACH - up	▨		
	down			
	to the side			
	forward			
19.	WORK W/ ARMS IN SPACE			
20.	BEND ELBOWS	▨		
21.	TURN ARM HALF WAY	▨		
22.	TURN WHOLE ARM	▨		
23.	GROSS GRASP	▨		
24.	FINE GRASP	▨		
25.	MANIPULATE	▨		
26.	LIGHT TOUCH			
27.	DEEP TOUCH			
28.	USE WHOLE LEG	▨		
29.	FOOT USE			
30.	APPLY FORCE - LEG	▨		
31.	LEG TOUCH	▨		
32.	GROSS COORD.	▨		
33.	FINE COORD.	▨		
34.	BILATERAL COORD.			
35.	SPEED			
36.	EYE - HAND COORD.	▨		
37.	EYE - FOOT COORD.			
38.	NON - VISUAL COORD.	▨		
39.	ACCURATE CLOSE VISION	▨		
40.	ACCURATE MEDIUM VISION	▨		
41.	ACCURATE FAR VISION	▨		
42.	DEPTH PERCEPTION			

SKILL NO.	SKILLS	OCCUPATIONAL PHYSICAL PROFILE	PERSONAL PHYSICAL PROFILE	
			w/o adapt.	• w/ adapt.
43.	PERIPHERAL VISION	▨		
44.	ACCOMODATION	▨		
45.	COLOR VISION	▨		
46.	DETECT TASTE/ODORS			
47.	HEAR	▨		
48.	TALK	▨		
49.	TALK ABOVE NOISE	▨		
50.	PHONE USE	▨		
51.	READ & WRITE	▨		
52.	USE DIAGRAMS/FORMS	▨		
53.	WORK INSIDE 75% +	▨		
54.	WORK OUTSIDE 75% +			
55.	WORK INSIDE & OUTSIDE			
56.	HIGH OR LOW TEMP.			
57.	ABRUPT TEMP. CHANGE			
58.	CONTACT W/ LIQUIDS			
59.	HIGH HUMIDITY			
60.	LOW HUMIDITY (DRY)			
61.	ATMOSPHERIC COND.	▨		
62.	EXCESSIVE NOISE	▨		
63.	VIBRATION/STRAIN			
64.	HAZARDS	▨		
65.	WORK ALONE			
66.	SHARE TOOLS/ENVIRON.	▨		
67.	WORK W/ OTHERS			
68.	WORK SCHEDULE	▨		
	full time			

Goal 3 - Development of Adaptation Guidelines

For each of the physical skills and working conditions identified, general adaptations were developed. The adaptations are organized into 3 categories:

Work process reorganization
Work/learning station modification
* Person adaptations, including mechanical aids, transferring of action from a weak to a stronger appendage, etc.

Each of the skills identified possible adaptations in the three categories wherever possible.

Instructors and employers can use these adaptation guidelines to modify the work/learning stations.

*Complete information and existing manuals can be obtained from the CACC under the Analysis and Adaptation Project.

CHAPTER VI

Evaluation

The evaluation procedure was conducted by a third party evaluation company, Validated Instruction Associates, Inc., Albion, Michigan. The comprehensive evaluation system is described in their final report that is reprinted for this section of the report.

INTRODUCTION

In recent years, state and federal legislation has reflected the increasing public concern for providing handicapped children with high quality, comprehensive educational services. Foremost among this legislation is the Education for all Handicapped Children Act of November, 1975 (Public Law 94-142), which assures a "free appropriate public education" for handicapped children in "the least restrictive environment," and which stresses the use of individual educational planning to address the specific educational needs and learning styles of handicapped students. Accordingly, special education programs throughout the country have been initiated and expanded to provide equal access to special education for all students. We see this trend developing in the Ingham Intermediate School District, where "special education centers" have evolved, and local school districts have developed cooperative programs to meet the needs of these exceptional students.

In keeping with Public Law 94-142, the State of Michigan has further mandated that special education programs accommodate the provision of vocational education to those students who both desire and can benefit from these programs. Capital Area Career Center is attempting to address this mandate. This nationally recognized program provides competency-based, individualized modular vocational education to the twelve constituent districts and 63,000 students served by the district.

The many successes of the CACC have received widespread attention on both the state and national levels. Based on a comprehensive job task analysis, the center has developed and tested over 3,000 occupational skill modules in over 70 occupational areas. This curriculum is supported by a responsive, computerized instructional management system which both provides data on individual student prescriptions and objectives achievement, and aggregates data useful in summative and formative program evaluation.

However, in the initial years of operation of the CACC, it was determined that modularized instruction, while allowing for individual differences in the time required to achieve performance objectives, did not necessarily provide the alternative presentation modes and learning strategies appropriate to the entering skills and characteristics of students with different learning styles. Consequently, it was decided to refine and branch the CACC curriculum to assure the effectiveness of its programs for every student served, regardless of physical or mental handicapping characteristics, language barriers, sex, educational level, or social/cultural factors.

Thus, in December, 1975, the Multiple Learning Strategies Project (MLSP) was proposed by CACC staff and funded by the U. S. Office of Education's Division of Vocational Education. The project began on July 1, 1976. The original date for completion was December, 1977. However, two proposals requesting three-month extensions were granted, moving the completion date to May, 1978. During this time media work will be finished, and final revisions will be made, enabling dissemination and full implementation of the revised curriculum during the current school year.

The stated goal[1] of the MLSP is this:

> "Each student will be able to achieve each identified objective in the occupation she/he has chosen, utilizing an instructional strategy that will enhance achievement, selected from alternatives available within an individual module."

This general goal is further broken into four objectives:[2]

1. Develop learning strategies that will enable Educable Mentally Impaired (EMI), visually impaired, and low-reading and regular vocational education students to achieve specified objectives.

2. Write modules, without sex bias, that portray women and minorities in non-traditional roles, incorporating identified strategies.

3. Identify environmental modifications needed for physically handicapped students.

4. Field test and evaluate modules and instructional manaagement system.

Third Party Evaluation

Provision was also made in the MLSP proposal for third party evaluation. A Request for Proposal was issued in August, 1976, and a contract for evaluation services was subsequently awarded to Validated Instruction Associates, Inc. (VIA) of Albion, Michigan. As part of the evaluation activities, VIA agreed to generate a series of three progress reports and one final report.

The present paper is the fourth and final report prepared in summation of the third party evaluation. It summarizes much of the data contained in the three progress reports in addition to presenting new information, assessments of the extent to which the MLSP goal and objectives have realized, and final recommendations.

This report is divided into four sections, including 1) Evaluation Tasks Accomplished, 2) Multiple Learning Strategies Project General Assessment, 3) Evaluation Data Analysis and Results, and 4) Summary. The report concludes with a series of appendices.

1. Evaluation Tasks Accomplished

The third party evaluation of the MLSP has included nine site visits to the CACC in Mason, Michigan; the design of four evaluation instruments; and the analysis of pre- and post-revision evaluation data. These activities are described in detail below.

Site Visits. The dates, tasks accomplished, and VIA staff participating in the eight site visits to Mason, Michigan, are as follows:

1. September 9, 1976. Initial data collection and discussion of MLSP and VIA contract revisions (see VIA, Inc. memo of 9-15-76). Barbara Collier, James Cook, Kirsten Hinsdale.

2. November 3, 1976. Discussion of evaluation strategies. Barbara Collier, James Cook, Kirsten Hinsdale.

3. November 9, 1976. Discussion of evaluation strategies and interviews with Judy Wiggins, Joellen Tororian, Karl Stearns, Georgette Silber, and Jack Adams of the CACC staff. Barbara Collier, Kirsten Hinsdale, David Koether.

4. December 9, 1976. Analysis of Module Analysis Cards for Building Maintenance program. Kirsten Hinsdale.

5. February 22, 1977. Consultation on field-testing and module evaluation and revision procedures. Barbara Collier and James Cook.

6. April 25, 1977. Random selection of 20 Building Maintenance Program modules for evaluation, consultation of MLSP progress with Supervisor, data collection from recently generated Module Analysis Cards. Barbara Collier, Kirsten Hinsdale.

7. August 30, 1977. Discussion of the current state of the MLSP, viewing of two slide/tapes, data collection. Kirsten Hinsdale, Barbara Collier.

8. December 1, 1977. Final data collection; discussion of MLSP accomplishments, extension, and dissemination. Consultation with Patricia Sullivan regarding environmental manipulations. Consultation with Dr. Jack Helder, Editorial Specialist, about final production efforts and viewing of three slide/tapes. Barbara Collier, James Cook.

MSLP Third Party Evaluation Systems. As a result of the first two site visits, VIA staff designed three systems for third party evaluation of the MLSP. These are the Module Evaluation System, the Program Evaluation System, and the General Evaluation System. The three systems incorporate 1) ongoing data from module field-testing by MLSP staff and the analysis of randomly selected modules by VIA staff; 2) pre- and post-revision data from teacher surveys, computerized CACC data, and non-computerized MLSP data; and 3) materials produced in connection with the environmental manipulations identified to enhance the performance of physically impaired students. As their names imply, the three systems will provide summative and formative information at three levels of aggregation, including a) individual modules, b) the five programs under revision, and c) the MLSP in general.

MSLP Evaluation Instruments. Based on interviews with CACC handicap specialists, teachers, and editorial and media specialists, the VIA, Inc. staff developed four evaluation instruments, including the Teacher Survey, the Student Module Evaluation, the Module Evaluation Form (for completion by the field-tester) and a Teacher Revision Form to provide feedback on the new modules (see Appendices). These forms were subject to revision by the MLSP staff. The latter Form was replaced by the Revision Recommendations (see Appendix F) sheet designed by Dr. Yoshinaga. It will be used on a voluntary, ongoing basis. While less precise, the latter system will both save teachers' time and the time required to isolate and make crucial revisions.

Third Party Evaluation Analyses. Several types of evaluation data have been collected and analyzed. Including:

1. Pre- and post-revision demographic data on students enrolled in the five programs, from the CACC Management Information System.
2. Student achievement and drop-out rates for the five programs, also from the CACC Management Information System.
3. Data on revisions required in the five programs, from the MLSP Module Analysis Cards.
4. Pre- and post-revision Teacher Survey data.
5. The content analysis by VIA staff of 20 randomly selected modules in the Building Maintenance Program, seven randomly selected modules in the Medical Assistant Program, eleven in the Dietetic Assistant Program, ten in the Small Engine Repair Program, and nine in the Graphics Program.
6. The submission of these randomly selected modules to the VIA, Inc. Sex and Minority Panel.
7. Field-test data on all five program areas and for all learning styles, including taped modules and slide/tape presentations; from the Student Module Evaluations and the Module Evaluation Form completed by the field-tester.
8. Data for ongoing revisions; from the Revision Recommendation Form.

The results of 1 - 8 above are discussed in Section 3, entitled, "Evaluation Data Analysis and Results".

2. MLSP General Assessment

The MLSP has been administered with the considerable foresight and organizational skill of Dr. Myrtle Yoshinaga, Project Supervisor. From the project's outset, Dr. Yoshinaga has systematically identified and assigned the tasks and time frames required for attaining project objectives, documented them, and communicated them to project staff members. In addition, Dr. Yoshinaga has successfully coordinated the third party evaluation effort and has solicited, as well, the cooperation of local special educators through a series of speaking engagements.

The MLSP has made several valuable contributions to the field of Special Education. The primary goal has been met: the implementation of the new curriculum incorporating all the modules which were revised during the course of the project.

The MLSP originally planned to implement the 1300 identified modules for the Building Maintenance, Medical Assistant, Dietetic Assistant, Small Engine Repair, and Graphics programs in the fall of 1977. Staff attrition early in the project and production problems, particularly difficulty in obtaining qualified writers for the Small Engine Repair and Graphics programs, have delayed this goal. However, stabilization of staff and the recent extension of the project should enable all modules selected for revision to be completed.

There follows a discussion of six component areas of specific accomplishments of the MLSP, including a) Module Analysis, b) Prototype Development, c) Module Production, d) Module Field-testing, e) Environmental Manipulations, and f) General Activities.

A. Module Analysis. Data on revisions required in the MLSP were derived from the Module Analysis Cards. Staff members noted reading level appropriate to each learning style, when additional pictures or practice would be desirable, if technical words should be added, or if tapes or audio-visuals would enhance the learning of the various groups of students. Many cards were cross-checked for accuracy and concurrance of opinion. The information on the cards was used by the production staff in revising the modules. An analysis of all Module Analysis Card data collected is contained in Section 3 of this report.

B. Prototype Development. Prototype modules were developed during the early stages of the MLSP. Based on extensive literature search, MLSP staff developed comprehensive treatment profiles and group treatment profiles for Educable Mentally Impaired, Visually Impaired, Low Readers, and Regular Vocational Education students (see Appendix E III for Sample Treatment Profile).

The completed written modules include six different formats. These are:

1. Regular Vocational (RV)
2. Regular Educable Mentally Impaired (EMI)
3. Regular Low Reader (LR); initially NR for Non-Reader(NR)
4. Regular Visually Impaired (VI)
5. Combination RV - LR (Graphics only)
6. Combination EMI - LR (Small Engine Repair only)

In addition, slide/tape presentations of "integrated" modules, which represent critical skill areas in the program areas, were designed. Later a prototype taped module for use with Low Readers, Visually Impaired, and Educable Mantally Impaired students was developed. Dr. Jack Helder, Editorial Specialist, and Ron Harper, Media Specialist until December, 1976, provided Dr. Yoshinaga with valuable assistance in prototype development. Craig Starnaman replaced Mr. Harper early in 1977 and provided stabilization to the MLSP staff. Nancy Lombardi replaced Mr. Starnaman in January, 1978. Her contribution in increasing production has been noteworthy.

C. Module Production. Dr. Yoshinaga has carefully monitored the entire production process. The MLSP staff consists of an editorial department with one editorial specialist and two assistant editors, and a media department which similarly includes one media specialist and two assistants. They are supported by a staff of two full-time and four part-time clerical staff.

To insure quality control, Dr. Yoshinaga designed a Module Checklist (see Appendix G) which is used by both the media and editorial staff in reviewing proof copies of the modules. Revision decisions were almost invariably based on data generated by one or more of the control systems designed and implemented by the Project Supervisor -- including the Checklist, the use of subject matter experts for module critique and feedback, and the final check on all modules by the secretarial supervisor. The overall high quality of all types of modules reviewed by VIA, Inc. staff reflect the creativity, ability and diligence of the MLSP staff in their production efforts.

Nevertheless, some problems with accuracy of information and illustrations in the modules were anticipated. The Revision Recommendation sheet provides a simple instrument for teachers to voluntarily idenfigy changes necessary in information, job steps, illustrations, and typographical errors. This has been helpful in making crucial revisions.

As of the date of this report, the MLSP has implemented most of the Regular Vocational (RV) modules, and modules addressed to the needs of the other learning styles will be incorporated into the curriculum during the 1977-78 school year.

Table I, page 10, identifies the number of modules revised according to Program and Learning Style. In addition to the information presented in Table I, a total of 157 modules were written for the Visually Impaired for use in all five programs and tapes were made to accompany the modules listed in Appendix Q.

Table I. MLSP Module Production

Program	Written Modules		Slide Tapes
BUILDING MAINTENANCE			
Regular Vocational	107		
Low Reader	107		
Educable Mentally Impaired	107		
TOTAL		321	9
DIETETIC ASSISTANT			
Regular Vocational	156		
Low Reader (Tape of RV mods)	—		
TOTAL		156	7
MEDICAL ASSISTANT			
Regular Vocational	130		
Low Reader (Tape of RV mods)	—		
TOTAL		130	5
SMALL ENGINE REPAIR			
Regular Vocational	75		
Low Reader	75		
Educable Mentally Impaired	75		
TOTAL		225	7
GRAPHICS			
Regular Vocational	230		
Low Reader	230		
Educable Mentally Impaired	27		
TOTAL		487	4
		1,319	32

D. Module Field Testing. To validate the effectiveness of the prototypes, early in the spring of 1977 twenty modules of the Building Maintenance Program were field tested on each of sixteen naive test subjects (including six Regular Vocational Students, four Low-Readers, and six Educable Mentally Impaired students), using the Field Test Data Sheet (Appendix H) as well as the Student Module Evaluation (Appendix J) and the Module Evaluation Form. A criterion test was used on approximately every fourth student to ensure that he/she actually could perform the skill(s) contained in the module being tested. Other field test subjects were "debriefed", i.e., asked to discuss the module and the difficulty, if any, experienced in completing it. The criterion tests and debriefing sessions proved more effective than simply having students complete the Module Evaluation Form, since many students had trouble in providing specific comments on the form.

An analysis of the Field Test Data Sheets for the Building Maintenance program is presented in Section 3.

In addition, the Visually Impaired modules were tested on three Visually Impaired adults. Speech adaptors were obtained by the Multiple Learning Strategies Project to allow students to increase the rate of speech as necessary on the audio-only tapes.

During the summer and early fall, MLSP staff efforts were directed toward completing module production, causing a lapse in the initial scheduling of module field testing. VIA, Inc. staff recommended that future field testing be limited to ten modules per program and that the same field-test subjects be used in remaining field test sessions, owing to time constraints. In addition it was recommended that criterion testing be used at the end of each field-test session. MLSP complied with both these recommendations.

In the fall of 1977, module field testing was resumed. Ten modules each for the Medical Assistant and Dietetic Assistant programs were field-tested using three Regular Vocational students and three Low Readers. Tapes accompanied the modules for the Low Readers. In addition, ten different modules from the Dietetic Assistant program, designed for the Visually Impaired, were field tested on three Visually Impaired students.

In the Small Engine Repair program, ten modules were field tested on three Regular Vocational students, two Low Readers and three Educable Mentally Impaired students. Graphics, the last program to be revised, had five modules field tested on three Regular Vocational students and three Low Readers. Tapes for the Low Readers are also available in these programs.

Finally, four slide-tape presentations written for Regular Vocational students were field tested by nine Educable Mentally Impaired subjects. In response to VIA's recommendation the test subjects were requested to write down the safety rules as a criterion check to determine if the information was being completely conveyed (see Appendix L for Slide-Tape Student Evaluation Sheet and Appendix I for the Slide-Tape Field Tester Evaluation Form).

The results of the field testing are described in detail in Section 3 of this report.

All of the above (A - D) were important developmental and validation components of the MLSP staff efforts to individualize instruction to best meet the needs of the various learning styles accommodated within the Capital Area Career Center.

E. Environmental Manipulations. A valuable contribution of the MLSP to the field of Special Education has been the identification of environmental modifications for physically impaired students.

Instruments were designed for "Job Analyses" -- to determine the physical requirement of various occupations (see Appendix K for Job Analysis Reporting Form), and for "Functional Analysis" -- to determine the physical performance capabilities of individual students.

Job analyses were performed on a representative sampling of occupations in each of the five program areas, and were validated both in classrooms and on-the-job locations in Lansing and in Jackson, Michigan. Discrepancies between classroom and on-the-job performance expectations proved to arise primarily from differences in facilities and materials availability rather than from discrepancies in physical job requirements (see Appendix M, Job Analysis Interpretation Guide).

For each program area the Job Analysis data were used in the design of two instruments for the "Functional Analysis" of individual students: one "Composite Task" (see Appendix N) and a corresponding series of related "Subtasks" (see Appendix O). Both will be used in home schools prior to the admission of students to the CACC. Other steps in the development of the functional analysis methodology involved analysis of the Composite Tasks using the Job Analysis Form to determine the extent to which they parallel the job analysis data -- development of a task profile. The Composite Tasks and Subtasks were submitted to two Occupational Therapists and two Teacher Consultants for the Physically Impaired and Other Health Impairments. Positive feedback was received along with minor recommended changes, primarily editorial in nature, which were incorporated into the final version of the materials.

Per VIA, Inc.'s recommendation, the Composite tasks and Subtasks for Employment Application, Dietetic Assistant and Building Maintenance and Engineering were field tested on three physically impaired students. As a result, changes were made in the readability of the narrative print and charts (see Appendix OO for Composite Task and Subtask Field Test Results).

After these field test and review activities were conducted, the portion of the MLSP concerned with environmental manipulations was transferred to the supervision of Patricia Sullivan, a Project Coordinator for the CACC. Under her guidance, adaptational guidelines for each occupation were developed and the Job Analysis Form was revised. To assist in synthesizing all collected data, she is writing individual case studies. Her approach emphasizes the sensitization of vocational education and special education teachers to the multiple needs of the physically impaired and to the treatment of each as a unique individual. Her approach is holistic and accounts both for special engineering requirements about which she has sought expert advice from consultants, and for the affective needs of these children whose handicaps often render them hostile in otherwise normal environments.

Six manuals have been produced to assist staff in enhancing the ahcievements of the physically impaired. The first, entitled "Adapting the Work and Learning Environment for the Physically Handicapped" details procedures for assessing a student's physical abilities, tests for 52 physical skills (from #1-STAND to #52 - USE DIAGRAMS/FORMS), and includes a section of Reproducible Forms for use by physicians, therapists, special education teachers and vocational education teachers who may be concerned with meeting the needs of physically impaired students in the world of work.

The remaining five manuals -- one each for Building Maintenance and Engineering, Dietary Assistant, Medical Assistant, Small Engine Repair, and Graphics -- define the job scope of each occupation, present an Occupational Physical Profile, an Occupation/Person Comparison Sheet, and Adaptation Guidelines for the physical skills and working conditions required appropriate to the occupation.

The manuals are attractive; the format is easy to read and each section is printed on a different color paper. More importantly, they provide a model for use by special education and vocational education teachers everywhere who are similarly combining vocational and special education.

Manuals for 28 additional program areas will be available by October, 1978.

F. General Activities. Dr. Yoshinaga made several public appearances, mostly at conferences, to inform Michigan professionals about MLSP and its methods and procedures. Four handouts were prepared for this purpose, each of which summarizes critical profile and treatment data for students of each learning style.

In addition, Dr. Yoshinaga has co-authored an article with Dr. Jim Kallman: "Compatability of Special Education and Vocational Education," School Psychology Digest, (in press).

Dr. Jack Helder, MLSP Editorial Specialist, spoke to Michigan State University students training to be resource teachers and teachers of Visually Impaired students.

The Multiple Learning Strategies Project provides a strong model of the compatibility of Special Education and Vocational Education. Moreover, the success of the MLSP has been acknowledged in the approval of both an extension and expansion of the project. A state funded expansion to develop modules in several sub-program areas began on October 1, 1977.

3. Evaluation Data Analysis and Results

As indicated above, three evaluation systems were designed for use in third party evaluation: the General Evaluation System, the Module Evaluation System and the Program Evaluation System. The ensuing discussion addresses the results and conclusions of the data analyses from the three systems.

A. General Evaluation System. The General Evaluation System incorporated 1) pre- and post-revision demographic data, 2) data on revisions required and revisions made in the five programs selected for the MLSP, and 3) an assessment of the materials produced on environmental manipulations. These are discussed below.

1. Demographic Data. Pre-revision information was available from two sources, including the Demographic Data Sheets and the Data Summary Sheets prepared by the MLSP. The former contained information from the last term of the 1975-76 school year and the first term of the 1976-77 school year. The

latter related only to the first term of the 1976-77 school year, but used the variable categories for learning style (i.e., EMI, visually impaired, low-reading, and regular vocational education) used throughout the MLSP. The category, "non-reader" was later changed by MLSP staff to the more accurate term "low-reader". The data from both sources are presented in Tables II - V below.

Table II. Demographic Data (5-26-76)

Key: EMI = Educable Mentally Impaired
VI = Visually Impaired
PI = Physically Impaired
LD = Learning Disabled
AD = Academic Difficulties

Program	Learning Style					Total	% of Handicapped (n=33)	% of Total (n = 133)
	EMI	VI	PI	LD	AD			
Building Maintenance	9	0	0	2	4	15	45.6	11.3
Health Related	3	0	2	0	0	5	15.2	6.8
Graphics	2	0	0	0	2	4	12.9	3.0
Small Engine Repair	2	1	0	0	6	9	27.3	6.8
Total	16	1	2	2	12	33		
% of Handicapped (n = 33)	48.5	3.0	6.1	6.1	36.4		100.0	
% of Total (n = 133)	12.0	.8	1.5	1.5	9.0			24.8

Table III. Demographic Data (9-15-76)

Program	Learning Style					Total	% of Handicapped (n=33)	% of Total (n = 133)
	EMI	VI	PI	LD	AD			
Building Maintenance	7	0	1	2	3	13	65.0	8.9
Health Related	0	0	2	0	0	2	10.0	1.4
Graphics	1	0	0	0	1	2	10.0	1.4
Small Engine Repair	0	1	0	1	1	3	15.0	2.1
Total	8	1	3	3	5	20		
% of Handicapped (n=20)	40	5	15	15	25		100.0	
% of Total (=146)	5.5	.7	2.1	2.1	3.4			13.7

Table IV. Demographic Data (2-77; from Data Summary Sheets)

Key: EMI = Educable Mentally Impaired
LR = Low Reader
VI = Visually Impaired

Program	Learning Style			Total	% of Handicapped (n = 31)	% of Total (n = 149)
	EMI	LR	VI			
Building Maintenance	7	9	0	16	51.6	10.7
Medical Assistant	0	1	0	1	3.2	.7
Graphics	1	7	0	1	25.8	5.4
Dietetic Assistant	0	0	0	0	0	0
Small Engine Repair	0	5	1	6	19.4	4.0
Total	8	22	1	31		
% of Handicapped (n = 31)	25.8	71.0	3.2		100.0	
% of Total (n = 49)	5.3	14.8	.7			26.1

Post-revision demographic data was available from the Data Summary Sheets only. As is apparent in both the above tables and Table V shown on top of the next page which depicts information on enrollment in the five programs as of September 28, 1977, the majority of handicapped students is concentrated in the Building Maintenance Program. However, post-revision data shows an increase in the percentage of handicapped students enrolled in the Small Engine Repair Program (from 19.4% to 30.4%) and a decrease in the Graphics Program (from 25.8% to 17.4%). The enrollment of students in these programs, of course, varies across time. According to both pre- and post-revision data, most of the handicapped students fall into the Low Reader category (82.6%), followed by the Educable Mentally Impaired (17.4%).

Table V. Demographic Data (9-28-77)

Key: EMI = Educable Mentally Impaired
VI = Visually Impaired
LR = Low Reader
RV = Regular Vocational

Program	Learning Style			Total	RV Students	% of Handi-capped (n=23)	% of Total (n =154)
	EMI	VI	LR				
Building Maintenance	4	0	6	10	20	43.6	6.4
Medical Assistant	0	0	1	1	37	4.3	.6
Graphics	0	0	4	4	35	17.4	2.6
Dietetic Assistant	0	0	1	1	11	4.3	.6
Small Engine Repair	0	0	7	7	28	30.4	4.5
Total	4	0	19	23	131		
% of Handicapped (n=23)	17.4	0	82.6			100.0	
% of Total (n=154)	2.5	0	12.3				14.7

The tables strongly substantiate the rationale for the MLSP, since at the time of its inception a full fifth of the students in the five programs selected for revision were handicapped. The revised curriculum, with its choice of modules carefully constructed to address the special needs of particular school populations is in keeping with the educational philosophy of providing appropriate educational opportunities for all.

2. Data on Revisions Required and Revisions Made. Data on revisions required in the MLSP were derived from the Module Analysis Cards. All cards are now complete.

The information on the completed Module Analysis Cards is summarized according to types of revisions required, by program, in Table VI, following the next page. The relative proportion of types of revisions required is similar to earlier data reports, with "reading" and "graphics" requiring the most revisions (98% each), followed by "practice" (95%), "technical words" (77%), "reading-audio" (57%), "audio-visual" (17%), "practice-audio" (1%), and audio-only (0%). All the programs required approximately the same percentage of overall revision, with a range from 51.3 to 59.8%, and a mean of 56.3%. However, types of revisions varied by program.

Graphics required the fewest "reading" revisions; Small Engine Repair and Medical Assistant required a relatively high percentage of "graphics" revisions; Medical Assistant and Graphics required the highest percentage of "reading-audio" revisions; Building Maintenance and Medical Assistant needed the most "audio-visual" presentations; Small Engine Repair, Dietetic Assistant, and Medical

Assistant required the most additional "practice"; and Small Engine Repair needed the most revision in "technical words", followed by Graphics and Building Maintenance.

It was evident in the content analysis of random modules selected from the five programs that the writers and artists relied heavily on the data from the Module Analysis cards to address the specific instructional needs of students of different learning styles. Comparison of a revised module with its Module Analysis Card substantiated that revisions were made accordingly.

TABLE VI. NUMBER AND PERCENT OF MODULE ANALYSIS CARDS INDICATING NEED FOR REVISIONS

Program	Types of Revisions								Average % Revisions Required
	Reading	Graphics	Reading-Audio	Audio-Only	Audio-Visual	Practice	Practice-Audio	Technical Words	
	#%	#%	#%	#%	#%	#%	#%	#%	
Building maintenance (n = 109)	109/100	100/91	26/24	0/0	53/49	91/84	2/2	93/85	59.6
Medical Assistant (n = 131)	131/100	128/98	110/84	0/0	29/22	129/98	3/2	95/73	59.8
Graphics (n = 68)	62/91	60/88	63/93*	0/0	9/13	64/94	0/0	58/85	58.0
Dietetic Assistant (n = 156)	156/100	148/95	103/66	0/0	0/0	154/99	0/0	100/64	53.0
Small Engine Repair (n = 68)	68/100	68/100	12/18	0/0	1/1	67/99	0/0	63/93	51.3
TOTAL (n = 532)	526/99	504/95	314/59	0/0	92/17	505/95	5/1	409/77	56.3

* For Low-Readers

3. Environmental Manipulations. The materials on environmental modifications required for the Physically Impaired were discussed in previous narrative. Its systematic approach in the development of Job Analysis and Functional Analysis forms is noteworthy. As mentioned, the completed manuals will be useful to classroom and vocational teachers in adapting the educational and vocational environment for the physically impaired.

B. Module Evaluation System. The most specific of the three evaluation components, the Module Evaluation System focused on the analysis of 1) field-test results for five to twenty written modules per program, including Student Module Evaluation forms (see Appendix B), student comments, and criterion test performance as available, 2) module content analysis data for seven to eleven randomly selected modules in each program, and 3) sex and minority panel evaluations of these random modules.

1. Field-Test Data. In early spring, 1977, modules from the Building Maintenance program were field-tested. In general, the data showed the following:

a. Regular Vocational Education students were found not to need the extensive pictures accompanying the texts; however, the pictures did not in any way interfere with learning.

b. Many students had difficulty with vocabulary, and required revisions were submitted to the production staff.

c. No major format changes were shown to be necessary in the modules.

d. Students were shown in the criterion tests to have learned careful clean-up and storage of equipment -- skills in which they were deficient in pre-revision curriculum. This was an unexpected finding in the field-tests.

e. Once students learned to negotiate the various formats used in the modules, the time for module completion for EMI, Low-Reading, and Regular Vocational students closely approximated one another. This finding was perhaps the most important in the field-test sessions, since it indicated that the learning processes of Low Readers and EMI students could be made to closely parallel that of Regular Vocational students. Thus it appeared that the primary stated objective of MLSP was being met.

The field-test data from the Student Module Evaluation forms are summarized in Table VII. As is apparent in this table, the modules were easy to read for students of all learning styles ($\overline{X} = 95.0$), as well as easy to understand ($\overline{X} = 89.0$) and easy to follow ($\overline{X} = 84.7$). In addition, most students found the pictures helpful ($\overline{X} = 84.7$) and the amount of information adequate ($\overline{X} = 85.3$), and were able to do the problems and exercises ($\overline{X} = 86.7$). The majority of the modules were rated "very good" ($\overline{X} = 54.3$), followed by "good" ($\overline{X} = 35.0$), and "fair" ($\overline{X} = 10.0$). Low Readers in general had least difficulty with the modules ($\overline{X} = 92.3$), followed by Regular Vocational Education ($\overline{X} = 87.7$) and EMI ($\overline{X} = 86.8$) students. The data are encouraging in that they indicate very little variation between students of the various learning styles, which tends to support the notion that the MLSP is in fact achieving its objective of facilitating the learning processes of Low Readers and EMI students so that they approximate those of Regular Vocational Education students.

TABLE VII SUMMARY OF STUDENT MODULE EVALUATION DATA BY LEARNING STYLE

BUILDING MAINTENANCE

Learning Style	Item From Student Evaluation Form																					Average Module Rating			
	1. Easy to Read			2. Easy to Understand			3. Easy to Follow Steps			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Mean %						
	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Y	S	N	Very Good	Good	Fair	Poor
Regular Vocational Education	96	4	0	87	10	3*	91	6	3	78	20	2	86	8	6	88	5	7**	87.7	8.8	3.5	43	44	11	2*
Non-Reading	94	6	0	90	10	0	87	13	0	91	9	0	96	4	0	96	4	0	92.3	7.7	0	76	12	12	0
Educable Mentally Impaired	95	4	1	90	9	1	91	7	2	85	15	0	74	5	1	76	24	0	86.8	10.6	.8	44	49	7	0
MEAN	95.0	4.7	.3	89.0	9.7	1.3	84.7	8.7	1.7	84.7	14.7	.7	85.3	5.7	2.3	86.7	11.0	2.3				54.3	35.0	10.0	.7

*Non-Reading Modules
**Felt there were no exercises

S = Sometimes
N = No

TABLE VII FIELD-TEST DATA FROM STUDENT MODULE EVALUATION

Module		Item From Student Evaluation Form																				
		1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Po
I. Wet Mopping to Disinfect 2201 01 004	RVE	100			100			100			40	60		100			100			40	60		
	NR	100			100			100			100			100			100			100			
	EMI	83	17		66	34		83	17		83	17		83	17		66	34		25	75		
II. Waxing Floors 2201 01 006	RVE	100			100			100			80	20		100			100			40	40	20	
	NR	100			75	25		75	25		50	50		100			100			25	25	50	
	EMI	100			83	17		83	17		66	34		83	17		66	34		50	33	17	
III. Sealing a Floor 2201 01 008	RVE	80	20		60	20	20	60	20	20	60	40		100			60	40		40	20	40	
	NR	100			100			100			100			100			100			75	25		
	EMI	100			100			83	17		100			83	17		66	34		40	60		
IV. Operation and Use of Wet Vacuum 2201 01 011	RVE	100			100			100			100			100			100			60	40		
	NR	75	25		75	25		75	25		100			100			100			75		25	
	EMI	100			83	17		100			100			83	17		66	34		17	83		
V. Use of An Automatic Floor Machine 2201 01 012	RVE	80	20		60	20	20	80		20	60	20	20	40	20	40	80		20		60	20	2
	NR	100			100			100			100			100			100			100			(NR
	EMI	66	17	17	66	34		83		17	83	17		66	34		60	20	20	40	40	20	Mo
VI. Floor Machine (buff) 2201 01 013	RVE	100			80	20		100			40	60		80	20		80	20		20	40	40	
	NR	100			75	25		75	25		50	50		100			75	25		50	25	25	
	EMI	100			83	17		66	17	17	83	17		83	17		100			25	50	25	
VII. Sweeping and Mopping Stairs 2201 01 014	RVE	100			80	20		60	40		80	20		80	20		100			40	20	40	
	NR	100			100			75	25		100			100			100			75	25		
	EMI	100			100			100			100			83	17		83	17		34	49	17	

TABLE VII Continued

Module		Item From Student Evaluation Form																					
		1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Poor
VIII. Cleaning Walls and Partitions 2201 03 004	RVE	80	20		80	20		100			100			80	20		80	20		60	20	20	
	NR	100			100			100			100			100			100			50	50		
	EMI	100			83	17		100			83	17		83	17		83	17		60	20	20	
IX. Breaking in a new Chalkboard 2201 04 001	RVE	100			100			100			100			100			100			40	60		
	NR	100			100			100			100			100			100			100			
	EMI	100			100			100			100			80	20		100			40	60		
X. Washing a new Chalkboard 2201 04 002	RVE	80	20		100			100			100			100			80		20*	60	20	20	
	NR	100			100			100			100			100			100			100			
	EMI	100			100			100			83	17		66	34		83	17		80	20		
XI. Vacuuming a Carpet 2201 05 003	RVE	100			80	20		80	20		80	20		100			100			20	80		
	NR	75	25		75	25		75	25		100			75	25		75	25		75		25	
	EMI	100			100			100			100			66	34		66	34		50	50		
XII. Spot Cleaning a Carpet 2201 05 004	RVE	100			100			100			100			100			80		20*	80	20		
	NR	100			100			100			100			100			100			100			
	EMI	100			100			100			100			83	17		100			50	50		
XIII. Dusting 2201 06 001	RVE	100			100			100			100			100			80		20*	80	20		
	NR	100			100			100			100			100			100			100			
	EMI	100			100			100			100			83	17		60	40		50	50		
XIV. Cleaning Desktop 2201 06 002	RVE	100			100			100			100			80	20		80		20*	60	20	20	
	NR	100			100			75	25		100			100			100			75		25	
	EMI	100			100			100			80	20		80	20		60	40		80	20		

121

122

*Felt there was no exercise.

TABLE VII Continued

Module		Item From Student Evaluation Form																					
		1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Poor
XV. Complete Care of Offices 2201 06 005	RVE	100			100			100			100			100			80		20*	60	40		
	NR	50	50		50	50		75	25		100			100			100			50	25	25	
	EMI	100			100			100			83	17		83	17		66	34		50	50		
XVI. Picking Up Trash and Papers 2201 08 001	RVE	100			100			80	20		80	20		80	20		100				100		
	NR	100			100			50	50		50	50		75	25		100			50	25	25	
	EMI	100			100			100			100			66	34		66	34		50	50		
XVII. Paper and Trash Disposal 2201 08 002	RVE	100			80		20	80		20	40	40	20	80		20	80		20	20	60		20
	NR	100			100		(NR	100		(NR)	100		(NR)	100		(NR)	100		(NR)	100			(NR)
	EMI	100			100		mod)	83	17		83	17		66	34		66	34		60	40		
XVIII. Dust Mopping 2201 00 001	RVE	100			100			100			60	40		100			100			40	60		
	NR	100			100			100			100			100			100			100			
	EMI	83	17		83	17		83	17		50	50		66	34		66	34		20	60	20	
XIX. Damp Mopping 2201 01 002	RVE	100			100			80	20		80	20		100			100			20	80		
	NR	100			75	25		75	25		75	25		100			100			50	50		
	EMI	83	17		83	17		83	17		66	34		34	50	16	66	34		25	50	25	
XX. Wet Mopping to Remove Dirt and Grease 2201 01 013	RVE	100			100			100			60	40		100			80		20*	60	40		
	NR	75	25		75	25		75	25		100			75	25		75	25		75		25	
	EMI	83	17		80		20	80	20		60	40		50	50		100			25	75		

*Felt there was no exercise.

The four remaining programs were field-tested in the fall of 1977. Data available were the same as mentioned in previous narrative for the Building Maintenance program.

In the Dietetic Assistant program, ten modules designed for Visually Impaired students were field-tested on three appropriate subjects (see Appendix P for Module Evaluation Form).

In general, the data showed the following:

a. The format and packaging of the modules enhanced the ability of the Visually Impaired to use the modules. Specifically, the color of the paper (sea green), combined with the large capital letter print, made the content easier to read than the old modules. Thicker paper, bound with a spiral, was easier for the students to handle.

b. Tapes accompanying the modules were used advantageously, enabling students to scan the printed information, thereby completing the module more quickly. The double space between the words helped to isolate the words more definitely, thus aiding the students to follow the text more easily in spite of the increased speed.

c. Use of the taped module focused concentration and eliminated daydreaming.

Ten modules were field-tested on three Regular Vocational students. Student feedback indicated the revised format is easier to read and provided suggestions to further improve the modules. For example, in 4501 03 003, Using the Blender, one student felt that access to the owner's manual would be helpful. All expressed appreciation for the opportunity to assist in the design of their own instructional materials.

Ten modules, accompanied by tapes, were field-tested on three Low Readers. The tester observed that the subjects varied the speed of the tape according to their reading ability, but tended to speed it up with practice. Lower tape speed did not appear to help concentration or increase comprehension of the information. Recall of job steps was excellent and the students were able to perform the tasks upon completion of the module.

Following is a list of the length of the taped modules:

Length of Taped Modules
Dietetic Assistant Program

Tape Number	Time (Regular Speed)
4501 03 004	4 minutes 11 seconds
4501 03 007	2 minutes 53 seconds
4501 03 012	3 minutes 51 seconds
4501 03 003	5 minutes 44 seconds
4501 03 013	5 minutes 2 seconds
4501 04 005	3 minutes 52 seconds
4501 02 020	10 minutes 14 seconds
4501 01 009	4 minutes 17 seconds
4501 02 011	4 minutes 6 seconds
4501 01 010	5 minutes 2 seconds

Because of the complexity of the material, there are no Educable Mentally Impaired students enrolled in this program.

The field-test data from the Student Module Evaluation forms are summarized in Table VII. As is apparent in this table, the modules were easy to read for all learning styles ($\bar{X}$ = 97.3), as well as easy to follow $\bar{X}$ = 97.3) and easy to understand ($\bar{X}$ = 93.6). In addition, all the Low Readers and almost all the Regular Vocational and Visually Impaired were able to do the problems ($\bar{X}$ = 96.3), and most felt the amount of information adequage ($\bar{X}$ = 91.3). The pictures were especially helpful to the Low Readers (93%), but the majority of all learning styles found them helpful ($\bar{X}$ = 79.3). Most of the modules were rated "very good" ($\bar{X}$ = 57.7), followed by "good" ($\bar{X}$ = 35.3) and "fair" ($\bar{X}$ = 7.0). As in the Building Maintenance program, there is little variation among students of the various learning styles; the data provides additional support to the evidence that the MLSP is meeting its objective of individualizing instruction appropriate to the needs of Low Readers and Visually Impaired students so their achievement approximates that of Regular Vocational Education students.

TABLE VIII. SUMMARY OF STUDENT MODULE EVALUATION BY LEARNING STYLE

Dietetic Assistant Program

Key: Y = Yes
S = Sometimes
N = No

earning tyle	Item From Student Evaluation Form																								
	1. Easy to Read			2. Easy to Understand			3. Easy to Follow Steps			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Mean %			Average Module Rating			
	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Y	S	N	Very Good	Good	Fair	Poor
egular ocational ducation	96	4	0	96	4	0	96	4	0	86	0	3*	84	10	6	93	3	4	92	5	3	66	22	12	0
ow Reader	100	0	0	96	4	0	100	0	0	93	0	7	100	0	0	100	0	0	98	.8	1.2	60	37	3	0
isually mpaired	96	4	0	89	7	4	96	4	0	59	13	0*	90	3	7	96	0	4	87	5.2	2.5	47	47	6	0
MEAN	97.3	4.0	0	93.6	5.0	4.0	97.3	4.0	0	79.3	4.3	3.3	91.3	4.3	4.3	96.3	1.0	2.6				57.7	35.3	7.0	0

*Subjects indicated some of the modules did not have pictures; therefore made no response.

Key: Y = Yes
S = Sometimes
N = No

TABLE VIII FIELD-TEST DATA FROM STUDENT MODULE EVALUATION

Dietetic Assistant Program, (continued)

Item From Student Evaluation Form (All test subjects Visually Impaired)

Module	1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Poor
I. Pot and Pan Washing in a 3 compartment sink 4501 03 0317	100			66	34		100			66	34		100			100				100		
II. Cleaning A Food Warmer 4501 03 0247	100			100			100			33⅓	33⅓	*	100			100			34	66		
III. Preparing Egg, Milk, Cheese & Casserole Dishes 4501 04 0107	100			100			100			100			100			100			34	66		
IV. Cleaning a Conveyor Belt 4501 03 0267	100			66	34		100			34	**		100			100			66	34		
V. Preparing Vegetables 4501 04 0117	100			100			100			100			100			100			66	34		

* Subject indicated there were no pictures.

S = Sometimes
N = No

TABLE VIII (Continued)

Module	Item from Student Evaluation Form (All test subjects Visually Impaired)																		Module Rating			
	1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems						
	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Poor
VI. Supervising the Production of Food Items 4501 04 0257	100			100			100			34	**		66		34	100			66	34		
VII. Preparing Coffee 4501 03 0277	100			100			100			34	66		100			100			34	66		
VIII. Preparing Meat, Poultry and Fish 4501 04 0097	100			100			100			100			100			100			100			
IX. Using the Diet Instruction Sheet 4501 05 0017	100			66		34	100				* * *		100			100			331/3	331/3	331/3	
X. Helping Dietetic Patients Plan For Food Purchases 4501 05 0117	66	34		100			66	34		34	* *		331/3	331/3	331/3	66		34	331/3	331/3	331/3	

* Subject indicated there were no pictures.

RV = Regular Vocational learner
LR = Low Reader

Key: Y = Yes
S = Sometimes
N = No

TABLE VIII FIELD-TEST DATA FROM STUDENT MODULE EVALUATION
Dietetic Assistant Program, continued

Module		Item From Student Evaluation Form																					
		1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Poor
I. Changing Menus to the Needs of Children Ages 1 - 6 4501 01 009	LR	100			66	34		100			100			100			100			34	66		
	RV	66	34		66	34		66	34		66	*		33⅓	33⅓	33⅓	66	34		34		66	
II. Changing Menus to the Needs of Pregnant & Lactating Women 4501 01 010	LR	100			100			100			100			100			100			66	34		
	RV	100			100			100			66	*		33⅓	33⅓	33⅓	66		34	33⅓	33⅓	33⅓	
III. Receiving Food Supplies 4501 02 020	LR	100			100			100			66		34	100			100				100		
	RV	100			100			100			66	*		100			100			66	34		
IV. Taking A Physical Inventory 4501 02 011	LR	100			100			100			100			100			100			66	34		
	RV	100			100			100			66		34	66	34		100			34	66		

* = no pictures

RV = Regular Vocational learner
LR = Low Reader

Key: Y = Yes
S = Sometimes
N = No

TABLE VIII (Continued)

Dietetic Assistant Program

Module		Item From Student Evaluation Form																					
		1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Poor
V. Using the Blender 4501 03 003	LR	100			100			100			100			100			100			66	34		
	RV	100			100			100			100			100			100			66	34		
VI. Cleaning A Blender 4501 03 004	LR	100			100			100			100			100			100			100			
	RV	100			100			100			100			100			100			66	34		
VII. Using the Disposal 4501 03 007	LR	100			100			100			100			100			100			34	66		
	RV	100			100			100			100			100			100			66	34		
VIII. Cleaning the Range 4501 03 012	LR	100			100			100			100			100			100			100			
	RV	100			100			100			100			100			100			100			
IX. Using the Oven (gas) 4501 03 013	LR	100			100			100			66		34	100			100			33⅓	33⅓	33⅓	
	RV	100			100			100			100			100			100			100			
X. Measuring Liquids 4501 04 005	LR	100			100			100			100			100			100			100			
	RV	100			100			100			100			100			100			100			

Ten modules each from the Medical Assistant and Small Engine Repair programs, as well as five modules from the Graphics program were field-tested on students hired to serve as test subjects. In general, the findings were similar:

a. Low Readers needed the taped modules, otherwise they would not have been able to recognize some of the words in the modules.

b. Low Readers liked controlling tape speed according to the difficulty of the material. Field-tester observed that tape rate increased with practice.

c. Field-tester noted eye fatigue when tape speed was maintained at a high level.

d. Field-tester concensus suggests that a limit of four or five modules should be completed at one sitting to decrease fatigue and boredom.

e. Student recall was good for the majority of modules tested.

f. Feedback from Regular Vocational Education students, particularly in the Medical Assistant program, emphasized the need for "hands on" experience, i.e., the use of a real thermometer for practicing readings, and access to a real machine for learning how to take an electrocardiogram.

The field-test data from the Student Evaluation forms for the Medical Assistant program are summarized in Table IX. Again, because of the technical nature of the material, no Educable Mentally Impaired students are enrolled in this program.

The data show that the majority of the students found adequate information in the modules ($\bar{X} = 93.5$), that the pictures were helpful ($\bar{X} = 89.5$), and that the job steps were easy to follow ($\bar{X} = 86.5$). When asked if the module was easy to read, easy to understand, and if they were able to do the problems, the mean ($\bar{X} = 83$) indicated a high degree of satisfaction. Two of the field-tested modules were complex and used a high percentage of technical words: "Taking An Electrocardiogram", and "How to Draw Medication from a Vial Into a Syringe". This factor accounts for the overall lower means in this program. The addition of the slide/tapes will help students understand the concepts. The majority of the Modules were rated "very good" ($\bar{X} = 53$), followed by "good" ($\bar{X} = 37$) and "fair" ($\bar{X} = 10$).

Low Readers rated the modules higher than Regular Vocational Education students, indicating the value of having a tape accompany the module.

Following is a list of the length of the taped modules:

Length of Taped Modules
Medical Assistant Program

Tape Number	Time (Regular Speed)
4401 07 017	27 minutes 31 seconds
4401 05 007	7 minutes 57 seconds
4401 11 006	11 minutes 50 seconds
4401 07 010	7 minutes 44 seconds
4401 09 005	9 minutes 55 seconds
4401 09 008	8 minutes 55 seconds
4401 08 019	7 minutes 44 seconds
4401 08 012	7 minutes 41 seconds
4401 08 008	10 minutes 39 seconds
4401 03 005	9 minutes 50 seconds

TABLE IX. SUMMARY OF STUDENT MODULE EVALUATION DATA

BY LEARNING STYLE

Medical Assistant Program

Key: Y = Yes
S = Sometimes
N = No

earning Style	Item From Student Evaluation Form																								
	1. Easy to Read			2. Easy to Understand			3. Easy to Follow Steps			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Mean %			Average Module Rating			
	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Y	S	N	Very Good	Good	Fair	Poor
egular ocational ucation	80	20	0	73	20	7	80	20	0	86	7	7	87	13	0	73	20	7	79.8	16.7	3.5	53	27	20	0
ow eader	86	14	0	93	7	0	93	7	0	93	7	0	100	0	0	93	0	7	93	7	0	53	47	0	0
MEAN	83	17	0	83	13.5	3.5	86.5	13.5	0	89.5	7	3.5	93.5	6.5	0	83	10	7				53	37	10	0

RV = REGULAR VOCATIONAL
LR = LOW READER

Key: Y = Yes
S = Sometimes
N = No

TABLE IX. FIELD - TEST DATA FROM STUDENT MODULE EVALUATION (continued)

Medical Assistant Program - Tapes Accompany Modules for Low Readers

Module		Item From Student Evaluation																					
		1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Poor
I. How To Sort Mail in the Physician's Office 4401 03 005	LR	66	34		100			66	34		66	34		100			100			34	66		
	RV	100			100			100			66	34		100			100			66	34		
II. How to Read A Thermometer 4401 05 007	LR	100			100			100			100			100			66		34	66	34		
	RV	100			66	34		100			66		34	100			66	34		33	33	33	
III. How to Receive and Prepare A Throat Culture 4401 07 010	LR	100			100			100			100			100			100			50	50		
	RV	100			100			100			100			100			100			66	34		
IV. Taking Electrcar-diogram 4407 017	LR	66	34		66	34		100			100			100			100			66	34		
	RV		100			66	34			100	100			34	66			66	34		34	66	
V. How to Set Up A Sterile Instrument Tray While [illegible]ring Gloves 4401 08 008	LR	100			100			100			100			100			100			50	50		
	RV	100			100			100			100			100			100			100			

RV = Regular
LR = Low Reader

Key: Y = Yes
S = Sometimes
N = No

TABLE IX (Continued)

Module		1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Very Good	Good	Fair	Poor
VI. How to Hold Sterile Gloves for Someone Else to Put On 4401 08 012	LR	100			100			100			100			100			100			66	34		
	RV	100			100			100			100			100			100			66	34		
VII. How to Clean Up After A Surgical Procedure 4401 08 019	LR	100			100			100			100			100			100			100			
	RV	100			100			100			66	*		100			100			66	34		
VIII. How to Determine the Nature of A Call... 4401 09 005	LR	100			66	34		100			66	*		100			100			34	66		
	RV	100			100			100			66	34		100			100			34	66		
IX. How to Interrupt & Re-establish Phone Calls 4401 09 008	LR	100			100			100			100			100			100			66	34		
	RV	100			100			66	34		100			100			100			34	66		
X. How to Draw Medication From Vial Into A Syringe 4401 11 006	LR	66	34		100			100			100			100			100			34	66		
	RV	66	34		66	34		100			100			100			100			34	66		

143

144

* [illegible] pictures

Specific data from the Small Engine Repair program are summarized in Table X. Of the five programs selected for revision, students of all learning styles rated these randomly selected modules the highest. All were able to do the problems ($\bar{X} = 100$). Almost all found them easy to read ($\bar{X} = 97.7$), easy to understand ($\bar{X} = 94.4$), easy to follow ($\bar{X} = 94.4$), the pictures helpful ($\bar{X} = 96.7$), and the information adequate ($\bar{X} = 94.4$). The majority of the modules were rated "very good" ($\bar{X} = 54.8$), followed by "good" ($\bar{X} = 45.2$). As the Module Analysis Cards called for 100 percent revisions in reading and graphics in this program, the field-test data show extraordinary success in the effective revision of Small Engine Repair modules.

TABLE X. SUMMARY OF STUDENT MODULE EVALUATION DATA
BY LEARNING STYLE
Small Engine Repair

Key: Y = Yes
S = Sometimes
N = No

earning Style	Item From Student Evaluation																								
	1. Easy to Read			2. Easy to Understand			3. Easy to Follow Steps			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Mean %			Average Module Rating			
	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Y	S	N	Very Good	Good	Fair	Poor
egular ocational ducation	100	0	0	93	7	0	93	7	0	100	0	0	93	7	0	100	0	0	96.5	3.5	0	40	60	0	0
ow eader	100	0	0	90	10	0	90	10	0	90	10	0	90	10	0	100	0	0	93.3	6.7	0	90	10	0	0
ducable entally mpaired	93	7	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	98.8	1.2	0	34	66	0	0
MEAN	97.7	2.3	0	94.4	5.6	0	94.4	5.6	0	96.7	3.3	0	94.4	5.6	0	100	0	0				54.8	45.2	0	0

Key: Y = Yes
S = Sometimes
N = No

TABLE X. FIELD-TEST DATA FROM STUDENT MODULE EVALUATION

Small Engine Repair Program (continued)

Module		Item From Student Evaluation																					
		1. Easy to Read			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	A	B	C	D
7501 24 010 Service Values	RVE	100			100			100			100			100			100			34	66		
7501 19 001 Install a Short Block in a Two Cycle Engine	RVE	100			100			100			100			66	34		100			34	66		
7501 08 002 Remove, Replace and Check Fly-wheel, Points	RVE	100			66	34		66	34		100			100			100			34	66		
7501 04 003 Timing a 2-Cylinder with Single Points	[illegible]VE	100			100			100			100			100			100			66	34		
7501 14 003 Removing, Replacing and Rebuilding Fuel Pumps	RVE	100			100			100			100			100			100			34	66		

Key: Y = Yes
S = Sometimes
N = No

TABLE X. FIELD TEST DATA FROM STUDENT MODULE EVALUATIONS

Small Engine Repair Program (continued)

Module		Item From Student Evaluation																					
		1. Easy to Reading			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	A	B	C	D
7501 06 004 1 Remove, replace and install electrical parts	LR	100			100			100			100			100			100			100			
	EMI	66	34		100			100			100			100			100			34	66		
7501 13 007 1 Condenser Series Resistance Test	LR	100			100			100			100			100			100			100			
	EMI	100			100			100			100			100			100			34	66		
7501 14 002 1 Timing a Single Cylinder-Points Accessible	LR	100			50	50		50	50		50	50		50	50		100			50	50		
	EMI	100			100			100			100			100			100			34	66		
7501 23 002 1 How to Install Piston Rings on the Correct Order	LR	100			100			100			100			100			100			100			
	EMI	100			100			100			100			100			100			34	66		
7501 23 003 1 Deglaze Cylinders and Check End Gap	LR	100			100			100			100			100			100			100			
	EMI	100			100			100			100			100.			100			34	66		

Data available on the five field-tested Graphics modules are summarized in Table XI. As is evident in this table, both Low Readers and Regular Vocational Education students rated the modules easy to read ($\overline{X} = 93$), the pictures helpful ($\overline{X} = 89.5$), and the amount of information adequate ($\overline{X} = 89.5$). The majority of the students were able to do the problems ($\overline{X} = 84.5$), and were easily able to follow the job steps ($\overline{X} = 80$). Seventy-three percent of the Regular Vocational Education subjects found the modules easy to understand, compared with 86% of the Low Readers. Again, the data support the use of tapes to increase comprehension of the written information.

The majority of the modules were rated "very good" ($\overline{X} = 63$), followed by "good" ($\overline{X} = 30$), "fair" ($\overline{X} = 3.5$) and "poor" ($\overline{X} = 3.5$).

TABLE XI. SUMMARY OF STUDENT MODULE EVALUATION DATA BY LEARNING STYLE

Graphics

Learning Style	Item From Student Evaluation Form																							
	1. Easy to Read			2. Easy to Understand			3. Easy to Follow Steps			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Mean %			Average Module Rating			
	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	Y	S	N	Very Good	Good	Fair	Poor
Regular Vocational Education	93	7	0	73	27	0	80	20	0	86	7	7	86	7	7	83	7	10	83.5	12.5	4.8	53	40	0	7
Low Reader	93	7	0	86	14	0	80	20	0	93	7	0	93	7	0	86	14	0	88.5	11.5	0	73	20	7	0
MEAN	93	7	0	79.5	20.5	0	80	20	0	89.5	7	3.5	89.5	7	3.5	84.5	10.5	5				63	30	3.5	3.5

LR = Low Reader
RV = Regular Vocational

Key: Y = Yes
S = Sometimes
N = No

TABLE XI. FIELD TEST DATA FROM STUDENT MODULE EVALUATION, (continued)

Graphics Program

Tapes Accompany Modules For Low Readers

Module		1. Easy to Reading			2. Easy to Understand			3. Easy to Follow			4. Pictures Helpful			5. Enough Information			6. Able to do Problems			Module Rating			
		%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	A	B	C	D
1401 07 007 Single and Book Page Margins	LR	100			100			100			100			100			100			100			
	RV	100			100			100			100			100			100			34	66		
1401 09 004 Learning to Use White Space in Paste-Up	LR	100			100			100			100			100			100			100			
	RV	100			100			100			66	34		100			100			100			
1401 09 007 Using the Ruling Pen	LR	100			100			100			100			100			100			100			
	RV	100			66	34		100			100			100			66	34		66	34		
1401 09 008 Using a Rapidograph Ruling Pen	LR	100			66	34		34	66		100			100			66	34		34	66		
	RV	100			66	34		66	34		100			100			100			34	66		
1401 09 009 Preparing Simple and Complex Cross Ruled Forms	LR	66	34		66	34		66	34		66	34		66	34		66	34		33	33	34	
	RV	66	34		34	66		33	33	33	66		34	34	33	33	50		50	33	33		34

Finally, four slide/tape presentations, written for the Regular Vocational student, were field-tested on Educable Mentally Impaired students.

Two of the unit modules, "Office Care" and "Carpet Care", were viewed by nine students, while the other two, "Floor Machine" and "Use of the Small Lawn Tractor", were viewed by eight.

Data from the Student Module Evaluations are summarized in Table XII (cf. Appendix I). While 88 percent of the students rated the "pictures helpful", only 78 percent found them "easy to understand", and only 76 percent felt there was adequate information in the presentations.

A check was made to determine if the information in the slide/tapes was being conveyed. As a criterion test, students were asked to list the safety rules (cf. Appendix L).

MLSP staff concluded from the results of the evaluations that the Educable Mentally Impaired student will have to view the slide/tape two to three times to understand the information completely.

Overall, the field-test data indicate that successful learning strategies which enhance student achievement of all learning styles have been developed by the Multiple Learning Strategies Project.

Key: Y = Yes
S = Sometimes
N = No

TABLE XII. FIELD TEST DATA FROM STUDENT MODULE EVALUATIONS

SLIDE/TAPES

All students who evaluated these slide tapes were Educable Mentally Impaired. The slide/tapes were written for the Regular Vocation student.

Unit Module	Item From Student Evaluation												
	Easy to Understand			Enough Pictures			Enough Information			Slide/Tape Rating			
	%Y	%S	%N	%Y	%S	%N	%Y	%S	%N	A	B	C	D
Office Care	100	0	0	78	22	0	100	0	0	63	37	0	0
Floor Machine	63	25	12	100	0	0	63	12	25	63	37	0	0
Carpet Care	63	37	0	88	12	0	55	34	11	67	33	0	0
Use of the Small Lawn Tractor	86	0	14	86	14	0	86	0	14	75	12½	12½	
MEAN	78	15.5	6.5	88	12	0	76	11.5	12.5	68	29	3	0

2. Content Analysis Data. Content analysis data were gathered through an analysis of randomly selected modules from all five programs under revision. The content analysis included: a) a comparison of the revised modules to the corresponding prerevision modules to determine the extent to which revised modules addressed the revisions indicated on the corresponding Module Analysis Cards, and b) a determination of the general quality of the modules. In conjunction with the sex and minority panel data, the content analysis provides thorough evaluation of randomly selected modules.

Seven randomly selected units (or 21 modules) from the Building Maintenance program were evaluated and submitted to the sex and minority panel:

2201 08 001	Paper and Trash Disposal
2201 04 002	Washing a Chalkboard
2201 05 006	Care of Carpets
2201 05 002	Shampooing Carpet with Rotary Machine
2201 01 008	Sealing a Floor
2201 01 002	Sinks and Mirrors
2201 01 015	Review and Practice

This represents every fifth unit of the 35 units which were completed at the time of module selection.

The content analysis showed the following:

Overall, it was evident that module writers have carefully used the information from both the Module Analysis Cards and the Treatment Profiles developed by the MLSP staff.

Reading levels in the revised modules are lower than in the pre-revision modules, thus addressing a major concern expressed on the Module Analysis Cards. The larger type in the new modules is also helpful. Words longer than three syllables are avoided, and short, simple sentences are used. Moreover, the addition of many illustrations and cartoons should further help ameliorate the reading problem that many students, especially EMI's and Low Readers, experience. Finally, in the Low Reading modules, only essential written instructions are included.

Initial field-test data (see above) would seem to indicate that these revisions in the reading level in the modules are indeed meeting the needs of EMI and Low-Reading students.

The word guides in the modules are helpful in addressing the concern with student understanding of technical words which is repeatedly evident on the Module Analysis Cards.

In EMI modules, competency tests and instructor checks were added. These will provide immediate performance feedback to the students and should thereby enhance their rate of learning. In addition, the integrated modules for students of all learning styles will further reinforce student learning processes by allowing the learner to practice individual skills in their larger procedural contexts and support retention.

The overall quality of the modules is good. Some small errors of an editorial nature were noted and relayed to the MLSP Project supervisor.

Seven modules were randomly selected form the Medical Assistant program for content analysis. These modules were designed for the Regular Vocational Education student, and included:

4401 03 001	How to do a Patient History
4401 04 009	How to Load and Operate an Autoclave
4401 05 024	Assisting the Doctor with a Pelvic Exam
4401 07 002	Instructing a Parent to use an Infant Urine Collector
4401 07 017	Taking Electrocardiogram
4401 08 007	How to Put on Sterile Gloves Using the Open Gloving Method
4401 08 019	Clean Up After Surgical Procedure

The Teacher Survey, conducted in January, 1977, indicated that the pre-revision Medical Assistant program often required teacher improvisation; that that the modules provided the least feedback of any of the programs, and that they least often conveyed job relevance and rationale. In addition, the reading level was often too high, requiring additional clarification, explanation, and/or repetition of the modules.

These deficiencies have all been corrected in the revised modules in the following ways:

The new format and enlarged print provide the basis for easy readability and comprehension of the information and job steps.

The Word Guide is now in context with word usage.

The reasons for learning the job skills are carefully stated.

Many simulations of job-related forms requiring student responses are used.

There is provision for adequate feedback. Positive reinforcement is frequently given in the form of written comments, as in module 4401 08 019: "Congratulations! If you've come this far you've been working for several days."

The illustrations in the revised modules help clarify the job steps, thus reducing the need for additional help from the instructor. For example, in module 4401 08 007 the drawings so clearly demonstrate the method of putting on sterile gloves that few words are needed.

Thus, the modules are generally clean, logically sequenced, and job-related. Moreover, they often allow for extra practice of the individual skills being learned and synthesis of related skills. Module 4401 07 017, "Taking Electrocardiograms," deserves special mention in this connection for its clear and concise presentation of the skills involved in performing a complicated medical procedure.

Eleven randomly selected modules were reviewed from the Dietetic Assistant program, including:

4501 01 007	Analyze Food Intake for Nutritional Adequacy
4501 01 009	Changing Menus to the Needs of Children Ages 1 - 6
4501 02 011	Taking a Physical Inventory
4501 03 001	Using an Institutional Mixer
4501 03 007	Using the Disposal
4501 03 013	Using the Oven (Gas)
4501 03 014	Cleaning the Oven
4501 03 019	Using the Steam Table
4501 03 002	Cleaning a Plate Warmer
4501 03 026	Cleaning a Conveyor Belt
4501 04 007	Weighing Ingredients

According to the Teacher Survey, modules in this program required the least amount of revision. However, survey data indicated that these modules had the fewest illustrations. Accordingly, there were only two illustrations in the 11 pre-revision modules. However, in their revised counterparts there are eighteen. In addition, the job steps in the revised modules are shorter and easier to comprehend. Hands-on experience is stressed, followed by adequate practice and teacher evaluation.

Pre-revision Dietetic Assistant modules used the threatening words pass, test, and evaluation. The substitution of the phrase, "We will know you can do it when:" in the revised modules is a substantial improvement.

In the Small Engine Repair program ten modules were randomly selected for content analysis. They were:

7501 01 017	How to Check Crankshaft End Play
7501 04 002	Removal, Replacement and Checking Lines for Wear or Leaks
7501 06 002	Check AC Charging System
7501 13 005	Operating the Mark II Dynometer
7501 14 001	Timing a Single Cylinder (Flywheel Covering Points)
7501 16 002	Drilling, Removing and Tapping Broken Studs
7501 18 002	Tune up Engine on Riding Mower
7501 21 002	Preparing a Chain Saw for Storage
7501 24 001	Remove and Replace a Valve Chamber, Breather or Cover
7501 24 010	Service Values

The Teacher Survey showed that Low Readers and EMI students had great difficulty with the pre-revision modules in reading, vocabulary, abstract concepts, attention and attitude. In fact, this program had the highest drop-out rate. Few illustrations were present. Further, it was felt that the rationale for the module and evidence of job relevance were inadequate.

The revised modules dramatically addressed these issues. The old modules defined technical words on the last page, while the revised modules employ the new formats with the Word Guide in context. An Information Section, also preceding the job steps, details relevant background material and the rationale for the skills to be learned. Sentences have been shortened, more technical words are defined and the graphics are the best to date.

Only one of the pre-revision modules had any illustrations, but all the revised modules use graphics appropriately and advantageously. The use of enlarged drawings to depict engine parts is far more effective than the use of photographs in earlier modules. The pre-revision modules required the instructor to explain how the student would use the information, equipment and materials in the Job Steps. The revised modules are self-explanatory, although there is always provision for teacher demonstration as an alternative teaching strategy.

Nine modules were reviewed from the Graphics program, including:

1401 06 004	Purchasing Paper and Using a Price Book
1401 07 007	Single and Book Page Margins
1401 08 020	Using Dry Transfer Lettering
1401 09 004	Learning to Use White Space in Paste-up
1401 09 007	Using the Ruling Pen
1401 09 008	Using a Rapidograph Ruling Pen
1401 09 009	Preparing Simple and Complex Cross-Ruled Forms
1401 11 016	Complete Stripping Project: Brochure
1401 16 010	Photo Assignment and Production

The Module Analysis Cards indicated that 91 percent of the modules required some revision in reading. This correlates with information obtained in the Teacher Survey which ranked the Graphics program second with "least appropriate vocabulary". Although the Teacher Survey indicated illustrations were most often present in Graphics, the Module Analysis Cards showed a need for still additional pictures. In addition, the Teacher Survey indicated this program ranked third in number of students who repeated modules.

All the modules reviewed were intended for use with Regular Vocational Education students. The teacher did not want to lower the reading level in the modules; therefore MLSP staff added many more illustrations to complement the written information (see Appendix R, Revised Module). The field-test data tended to support this strategy, with 93 percent of the subjects indicating the modules were easy to read, and 89.5 percent that the pictures were helpful.

All modules in the Dietetic Assistant and Medical Assistant programs will be taped to assist in the comprehension of the material by the Low Reader, RV, and Visually Impaired populations. These two strategies assume that repetition of the information, either visually or audibly, will enhance comprehension.

The format, which proved successful in the other programs, provides the basis for easy readability and following the job steps. There is provision for practicing job skills along with provision for frequent instructor checks at the crucial stages. The rationale for learning the job skills is carefully stated, maintaining motivation.

The content analyses of the five programs verify that MLSP staff adequately addressed the needs expressed on the Module Analysis Cards and have employed different learning strategies that will benefit all the student populations. Certainly overall quality of the modules is very good.

Sex and Minority Panel Data. The sex and minority panel, which consisted of two sub-contracted female subject matter experts (one white, one black) was asked to evaluate the same modules which were randomly selected from each program for content analysis. Their evaluation determined the extent to which the modules were "without sex bias and portrayed women and minorities in non-traditional roles" (see Appendix X, memo of April 30, 1977 to Sex and Minority Panel).

Reports from the two member panel are contained in Appendix T. Their general findings are summarized below:

In the Building Maintenance and Medical Assistant programs, module writers successfully eliminated sex bias in the written portion of the modules by avoiding the use of sex references in job titles and the exclusive use of male gender pronouns (i.e., "he" and "him" are replaced by "he/she" and "him/her"). Though awkward, this pronoun usage is considered important to the elimination of written sex bias not only by the sex and minority panel, but also by the third party evaluators.

While an effort was made to use illustrations of women and minority persons, they still are underrepresented in the modules--especially minority persons. For example, in the three review and practice units, there are two women and 27 men portrayed. In addition, both sex and minority panel members objected to the occasional use of cartoon figures which appeared to be caricaturing both women and minorities (e.g., in modules 2201 04 002 and 2201 01 015 1). Finally, one member of the panel suggested that in all illustrations of women, the female form should be more clearly defined (2201 08 002 3 and 2201 08 002).

The panel found that women were fairly frequently portrayed in non-traditional roles, with one exception, where in module 2201 05 001 women are shown vacuuming and men moving furniture. The panel was unable to determine whether or not minorities were adequately portrayed in non-traditional roles due to the infrequent use of minority persons.

In general, the people pictured in the modules are, with very few exceptions, white. Not only should more blacks be portrayed, but other minorities--Chicano, Native American, and Asian--as well.

In the Dietetic Assistant program the graphics portrayed equal numbers of males and females, and a male was shown in one illustration in the non-traditional role of feeding a child. However, women were shown using an oven and cleaning an oven, both traditionally female tasks. The panel felt it would be desirable to portray a male performing one of those tasks.

With regard to race, only one of the ten pictures in the Dietetic Assistant modules submitted to the panel depicted a black person. It was felt that more blacks and browns were needed.

In modules from the Small Engine Repair program there was a good representation of black persons. Of the twenty-five illustrations which depicted hands working on an engine, eleven were shaded. However, the sex of the people was identifiable in only seven of these illustrations. Two women were shown in non-traditional roles (i.e., working on a snowmobile and carrying a large box).

In modules from the Graphics program, the Sex and Minority Panel noted the writers were careful to be impartial in the words they used--"you"--"person"--"customer"--and finally,--"he/she." The latter also suggests that both men and women can fill the roles mentioned.

Minorities are shown in these modules doing things that they do not do traditionally.

In conclusion, the panel reported: "It is evident that the illustrators and authors for all of the modules we have evaluated have tried very hard to avoid any sex bias and to portray women and minorities in non-traditional roles. With very small exception they have succeeded."

C. Program Evaluation System. The Program Evaluation System concentrates on an assessment of the general impact of the MLSP as measured by 1) pre- and post-revision Teacher Surveys for each program, and 2) pre- and post-revision Student Change of Goal Rates, Student Drop-Out Rates, and Absentee Rates for each program. The data was gathered from a readministration of the VIA-designed Teacher Survey at the end of October, 1977 and the collection of Data Summary Sheets for the fall term, 1977.

As a result of production delays, it will be necessary for the Program Evaluation System to concentrate in the post-revision curriculum on the written modules for Regular Vocational Education students only, since only modules of this type were in use the fall of 1977 when the data was collected. Some modules for Educable Mentally Impaired and Low Readers have been implemented in the classroom since then. At the time of this report modules for the Visually Impaired are being printed and should be available for classroom use in February, 1978.

Since field-test results (see Section B, part 1, above) indicate that in the new modules the learning rates for Educable Mentally Impaired, Low Readers, and Visually Impaired students closely parallel those for Regular Vocational Education students, the results of the RV-only Program Evaluation data analyses may be safely extrapolated to other populations.

The ensuing discussion of the Program Evaluation data is divided into four sections, including a) Pre- and Post-Revision Teacher Survey results, b) Teacher Survey Discussion, c) Student Change of Goal Rates, Drop Out Rates, and Absentee Rates, and d) Discussion.

Teacher Survey Results. The Teacher Survey was first administered in January, 1977, to one teacher in each of the five program areas (Building Maintenance, Medical Assistant, Graphics, Dietetic Assistant, and Small Engine Repair). It was administered a second time in October, 1977. Together they yield the data shown in Tables XIII - XXX, which follow. For easy comparison, the post-revision data for each section of the survey immediately follows the pre-revision data.

TABLE XIV. INSTRUCTOR EXPERIENCE (Item A.1)

Key EMI = Educable Mentally Impaired
VI = Visually Impaired
LR = Low Reader
RVE = Regular Vocational Education
PI = Physically Impaired

Program/Occupation	Number of Students Served				Total
	EMI	VI	LR	RVE	
Building Maintenance	24	0	21	6	51
Custodian*	0	0	50	0	50
Building Maintenance	0	0	10	0	10
Hospital Custodian	0	0	4	0	4
Building Engineer	0	0	0	0	0
Carpenter Maintenance	0	0	12	0	12
Medical Assistant	0	2	2	130	134
Graphic Arts					
Duplicating machine Operator	0	0	13	70	83
Press Operator	0	0	7	15	22
Finishing Technician	3	0	2	3	8
Cameraman	0	0	0	10	10
Compositor	1	0	0	12	13
Dietetic Assistant	0	0	0	44	44
Small Engine Repair	2	1	7	120	130
Total	30	3	128	410	571

* There are two instructors in the Building Maintenance Program. All the Teacher Survey Tables reflect two responses in this program. It should be noted that one considered the revised modules when answering the questions; the other did not as he had not implemented the revised modules when he completed the survey.

October 1977

TABLE XV. LEVELS OF DIFFICULTY (Items B.1-3)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	ER	RVE	
B.1. Extent to which reading level is appropriate:	Building Maintenance	4	4	4	1	3.3
	Medical Assistant	-	-	3	3	3.0
	Graphics	4	2	3	1	2.5
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	4	1	4	1	2.5
	Mean	4.0	2.3	3.5	1.4	2.8
B.2 Extent to which vocabulary is appropriate:	Building Maintenance	3	3	3	2	2.8
	Medical Assistant	-	-	3	2	1.3
	Graphics	4	2	2	1	2.3
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair .	3	1	3	1	2.0
	Mean	3.3	2.0	2.8	1.4	2.4
B.3. Extent to which modules frustrate students:	Building Maintenance	4	4	4	2	3.3
	Medical Assistant	-	-	1	2	1.5
	Graphics	1	4	1	4	2.3
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	1	4	1	4	2.3
	Mean	2.0	4.0	1.8	3.2	2.8

TABLE XVI. LEVELS OF DIFFICULTY (Items B.1-3)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
B. 1. Extent to which reading level is appropriate:		*1	-	2	2	1.7
	Building Maintenance	1	-	2	2	1.3
	Medical Assistant	-	-	-	1	1.0
	Graphics	3	2	2	1	2.0
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	-	1	-	1	1.0
	Mean	1.7	1.5	1.7	1.3	1.3
B. 2. Extent to which vocabulary is appropriate:		*1	-	1	2	1.3
	Building Maintenance	1	-	1	2	1.3
	Medical Assistant	-	-	-	1	1.0
	Graphics	2	1	2	1	1.5
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	-	1	-	1	1.0
	Mean	1.3	1.0	1.3	1.3	1.2
B. 3. Extent to which modules frustrate students:		4	-	4	4	4.0
	Building Maintenance	3	-	4	4	3.6
	Medical Assistant	-	-	-	4	4.0
	Graphics	2	4	3	4	3.3
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	-	3	-	3	3.0
	Mean	3.0	3.5	3.6	3.8	3.7

*Revised answers, 1/5/78, to reflect opinion on new curriculum.

TABLE XVII. CLARITY (Items C.1-4)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
C.1. Extent to which clarification of instructions is required:	Building Maintenance	1	1	1	2	1.3
	Medical Assistant	-	-	1	2	1.5
	Graphics	1	4	3	4	3.0
	Dietetic Assistant	-	-	-	3	3.0
	Small Engine Repair	1	3	1	3	2.0
	Mean	1.0	1.5	1.2	2.8	1.6
C.2. Extent to which additional explanation of concepts is required:	Building Maintenance	1	3	1	3	2.0
	Medical Assistant	-	-	1	2	1.5
	Graphics	1	3	2	3	2.3
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	1	1	1	2	1.3
	Mean	1.0	2.3	1.3	3.0	1.9
C.3. Extent to which supervision is required:	Building Maintenance	1	2	1	2	1.5
	Medical Assistant	-	-	1	3	2.0
	Graphics	1	3	3	3	2.5
	Dietetic Assistant	-	-	-	3	3.0
	Small Engine Repair	1	3	1	4	2.3
	Mean	1.0	2.7	1.5	3.0	2.1
C.4. Extent to which additional help with problems is required:	Building Maintenance	1	1	1	2	1.3
	Medical Assistant	-	-	1	2	1.3
	Graphics	1	4	3	4	3.0
	Dietetic Assistant	-	-	-	3	3.0
	Small Engine Repair	1	3	1	3	2.0
	Mean	1.0	1.5	1.2	2.8	1.6

TABLE XVIII. CLARITY (Items C.1-4)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
C. 1. Extent to which clarification of instructions is required:	Building Maintenance*	2	-	2	2	2.0
		2	-	2	2	2.0
	Medical Assistant	-	-	-	4	4.0
	Graphics	1	4	3	4	3.0
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	1	2.5	1	3	2.1
	Mean	1.5	3.3	2.0	3 2	2.85
C. 2. Extent to which additional explanation of concepts is required:	Building Maintenance*	2	-	2	2	2.0
		2	-	2	2	2.0
	Medical Assistant	-	-	-	4	4.0
	Graphics	1	4	3	4	3.0
	Dietetic Assistant	-	-	-	3	3.0
	Small Engine Repair	1	3.5	1	3.5	3.1
	Mean	1.5	3.8	2.0	3.0	2.9
C. 3. Extent to which supervision is required:	Building Maintenance*	4	-	4	4	4.0
		1	-	1	2	1.3
	Medical Assistant	-	-	-	4	4.0
	Graphics	1	3	3	4	2.8
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	1	3	1	3	2.0
	Mean	1.8	3.0	2.3	3.5	3.4
C. 4. Extent to which additional help with problems is required:	Building Maintenance*	2	-	2	2	2.0
		1	-	2	3	2.0
	Medical Assistant	-	-	-	4	4.0
	Graphics	2	4	4	4	3.5
	Dietetic Assistant	-	-	-	3	3.0
	Small Engine Repair	1	3.5	1	3.5	3.1
	Mean	1.5	3.8	2.3	3.3	3.5

*Two instructors.

TABLE XIX. TEACHING STRATEGIES (Items D.1-3)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
D.1. Extent to which alternative strategies are inherent in modules:	Building Maintenance	3	3	3	3	3.0
	Medical Assistant	-	-	1	1	1.0
	Graphics	2	2	2	2	2.0
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	4	4	4	4	4.0
	Mean	3.0	3.0	2.5	2.8	2.8
D.2. Extent to which improvisation is required:	Building Maintenance	1	2	4	3	2.3
	Medical Assistant	-	-	1	1	1.0
	Graphics	1	3	3	4	2.8
	Dietetic Assistant	-	-	-	3	3.0
	Small Engine Repair	1	3	1	4	2.3
	Mean	1.0	2.7	2.3	3.0	2.3

TABLE XX. TEACHING STRATEGIES (Items D.1-2)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
D. 1. Extent to which alternative strategies are inherent in modules:	Building Maintenance	2	-	2	2	2.0
		2	-	2	3	2.3
	Medical Assistant	-	-	-	4	4.0
	Graphics	2	2	2	1	1.8
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair*					
	Mean	2.0	2.0	2.0	2.8	3.6
D. 2. Extent to which improvisation is required:	Building Maintenance	4	-	4	4	4.0
		1	-	1	3	5.0
	Medical Assistant	-	-	-	4	4.0
	Graphics	1	4	1	4	2.5
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair*					
	Mean	2.0	4.0	2.0	3.8	3.8

*No response

October 1977

TABLE XXI. MODULE CONSTRUCTION (Items E.1-4)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
E.1.. Extent to which practice is allowed:	Building Maintenance	1	1	1	1	1.0
	Medical Assistant	-	-	1	1	1.0
	Graphics	1	3	3	3	2.5
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.0	1.0	1.0	1.6	1.2
E.2. Extent to which students must repeat modules:	Building Maintenance	2	2	2	2	2.0
	Medical Assistant	-	-	2	3	2.5
	Graphics	1	3	3	3	2.5
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	-	-	-	-	-
	Mean	1.5	2.5	3.0	3.4	2.6
E.3. Extent to which illustrations are present:	Building Maintenance	2	2	2	2	2.0
	Medical Assistant	-	-	3	3	3.0
	Graphics	2	2	2	2	2.0
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	4	4	4	4	4.0
	Mean	2.7	2.7	2.8	3.0	2.8
E.4. Extent to which modules provide feedback:	Building Maintenance	2	2	2	2	2.0
	Medical Assistant	-	-	4	4	4.0
	Graphics	1	2	2	2	1.8
	Dietetic Assistant	-	-	-	2	2.0
	Small Engine Repair	-	-	-	-	-
	Mean	1.5	2.0	2.7	2.5	2.2

TABLE XXII. MODULE CONSTRUCTION (Items E.1-4)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
E. 1. Extent to which practice is allowed:	Building Maintenance	1	-	1	1	1.0
		1	-	1	2	1.3
	Medical Assistant	-	-	-	1	1.0
	Graphics	1	1	1	1	1.0
	Dietetic Assistant	-	-	-	3	3.0
	Small Engine Repair	1	2	1	2	1.5
	Mean	1.0	1.5	1.0	1.7	1.5
E. 2. Extent to which students must repeat modules:	Building Maintenance	3	-	3	3	3.0
		1	-	1	3	1.7
	Medical Assistant	-	-	-	4	4.0
	Graphics	1	4	3	4	3.0
	Dietetic Assistant	-	-	-	4	4.0
	Small Engine Repair	1	2	1	2	1.5
	Mean	1.5	3.0	2.0	3.3	3.1
E. 3. Extent to which illustrations are present:	Building Maintenance	1	-	1	1	1.0
		2	-	2	2	2.0
	Medical Assistant	-	-	-	1	1.0
	Graphics	1	1	1	1	1.0
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.3	1.0	1.3	1.2	1.2
E. 4. Extent to which modules provide feedback:	Building Maintenance	3	-	3	3	3.0
		1	-	1	1	1.0
	Medical Assistant	-	-	-	2	2.0
	Graphics	2	2	2	2	2.0
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair*					
	Mean	2.0	2.0	2.0	1.8	1.8

*No response

TABLE XXIII. MODULE TRANSFERENCE (Items F.1-4)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
F.1. Extent to which students understand the rationale for modules:	Building Maintenance	2	2	2	2	2.0
	Medical Assistant	-	-	2	2	2.0
	Graphics	4	1	1	1	1.8
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	-	1	-	1	1.0
	Mean	3.0	1.3	1.7	1.4	1.9
F.2. Extent to which examples are relevant to occupations:	Building Maintenance	1	1	1	1	1.0
	Medical Assistant	-	-	2	2	2.0
	Graphics	1	1	1	1	1.0
	Dietetic Assistant	-	-	-	2	2.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.0	1.0	1.3	1.4	1.2
F.3. Extent to which modules convey work values:	Building Maintenance	2	2	2	2	2.0
	Medical Assistant	-	-	-	2	2.0
	Graphics	2	2	2	2	2.0
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	4	4	4	4	4.0
	Mean	2.7	2.7	2.5	2.2	2.5
F.4. Extent to which modules are job relevant:	Building Maintenance	1	1	1	1	1.0
	Medical Assistant	-	-	1	1	1.0
	Graphics	1	1	1	1	1.0
	Dietetic Assistant	-	-	-	2	2.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.0	1.0	1.0	1.2	1.1

TABLE XXIV. MODULE TRANSFERENCE (Items F.1-4) October 1977

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
F.1. Extent to which students understand the rationale for modules:	Building Maintenance	2	-	2	2	2.0
		2	-	2	2	2.0
	Medical Assistant	-	-	-	1	1.0
	Graphics	3	1	2	1	1.8
	Dietetic Assistant	-	-	-	2	2.0
	Small Engine Repair	-	1	-	1	1.0
	Mean	2.3	1.0	2.0	1.5	1.6
F.2. Extent to which examples are relevant to occupations:	Building Maintenance	2	-	2	3	2.3
		1	-	1	1	1.0
	Medical Assistant	-	-	-	1	1.0
	Graphics	2	1	1	1	1.3
	Dietetic Assistant	-	-	-	3	3.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.5	1.0	1.3	1.7	1.6
F.3. Extent to which modules convey work values:	Building Maintenance	3	-	3	3	3.0
		1	-	1	1	1.0
	Medical Assistant	-	-	-	2	2.0
	Graphics	2	1	2	1	1.5
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	2	2	2	2	2.0
	Mean	2.0	1.5	2.0	1.6	1.8
F.4. Extent to which modules are job relevant:	Building Maintenance	1	-	1	1	1.0
		1	-	1	1	1.0
	Medical Assistant	-	-	-	1	1.0
	Graphics	1	1	1	1	1.0
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.0	1.0	1.0	1.0	1.0

TABLE XXV. INDUSTRIAL STANDARDS (Item G.1)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
G.1. Extent to which modules reflect industry standards:	Building Maintenance	1	1	1	1	1.0
	Medical Assistant	-	-	1	1	1.0
	Graphics	1	1	1	1	1.0
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.0	1.0	1.0	1.0	1.0

TABLE XXVI. STUDENT INTEREST (Items H.1-2)

Key as in Table XXV. above

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
H.1. Extent to which students are motivated:	Building Maintenance	2	2	2	1	1.8
	Medical Assistant	-	-	1	1	1.0
	Graphics	3	1	1	1	1.5
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	-	-	-	-	-
	Mean	2.5	1.5	1.3	1.0	1.3
H.2. Extent to which students succeed:	Building Maintenance	1	1	1	1	1.0
	Medical Assistant	-	-	3	2	2.5
	Graphics	3	1	1	1	1.5
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.7	1.0	1.5	1.2	1.4

TABLE XXVII. INDUSTRIAL STANDARDS (Item G.1)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
G.1. Extent to which modules reflect industry standards:	Building Maintenance	2	-	2	2	2.0
		1	-	1	1	1.0
	Medical Assistant	-	-	-	1	1.0
	Graphics	2	1	1	1	1.3
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.5	1.0	1.3	1.2	1.2

TABLE XXVIII. STUDENT INTEREST (Items H.1-2)

Key as in Table XXVII. above

Item	Program	Learning Style				Mean
		EMI	VI	LR	RVE	
H.1. Extent to which students are motivated	Building Maintenance	1	-	1	1	1.0
		2	-	2	2	2.0
	Medical Assistant	-	-	-	1	1.0
	Graphic	3	1	1	1	1.5
	Dietetic Assistant	-	-	-	2	2.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.8	1.0	1.3	1.3	1.4
H.2. Extent to which students succeed:	Building Maintenance	1	-	1	1	1.0
		2	-	2	2	2.0
	Medical Assistant	-	-	-	1	1.0
	Graphic	2	1	1	1	1.3
	Dietetic Assistant	-	-	-	1	1.0
	Small Engine Repair	1	1	1	1	1.0
	Mean	1.5	1.0	1.3	1.2	1.2

TABLE XXIX. GENERAL QUESTIONS (Items I. 1, 3, 4, and 5)

Key: 1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Response Options					Mean
I.1. Extent to which program requires environmental modifications for physically impaired (PI):		PI only					
	Building Maintenance	4					
	Medical Assistant	1					
	Graphics	2					
	Dietetic Assistant	1					
	Small Engine Repair	2					
	Mean	2.0					2.0
I.3. Extent to which EMI's have trouble with abstract concepts (AC), reading (R), vocabulary (V), math (M), and attention (A):		AC	R	V	M	A	
	Building Maintenance	1	2	2	1	2	1.6
	Medical Assistant	-	-	-	-	-	-
	Graphics	1	2	2	1	1	1.4
	Dietetic Assistant	-	-	-	-	-	-
	Small Engine Repair	-	1	1	-	1	1.0
	Mean	1.0	1.7	1.7	1.0	1.3	1.3
I.4. Extent to which VI's have trouble with print (P), motivation (M), and attitude (A):		P	M	A			
	Building Maintenance	-	-	-			-
	Medical Assistant	-	-	-			-
	Graphics	4	2	2			2.7
	Dietetic Assistant	-	-	-			-
	Small Engine Repair	2	4	4			3.3
	Mean	3.0	3.0	3.0			3.0
I.5. Extent to which non-readers have trouble with attitude (A), and motivation (M):		A	M				
	Building Maintenance	3	1				2.0
	Medical Assistant	2	1				1.5
	Graphics	4	4				4.0
	Dietetic Assistant	-	-				-
	Small Engine Repair	1	1				1.0
	Mean	2.5	1.8				2.1

TABLE XXX. GENERAL QUESTIONS (Items I. 3,4, and 5)

Key:
1 = to a great extent
2 = to an extent
3 = to a little extent
4 = to a very little extent

Item	Program	Response Options					Mean
		PI only					
I. 1. Extent to which program requires environmental modifications for physically impaired (PI):	Building Maintenance	3					
	Medical Assistant	1					
	Graphics	2					
	Dietetic Assistant	1					
	Small Engine Repair	-					
	Mean	2.0					2.0
		AC,	R,	V,	M,	A	
I. 3. Extent to which EMI's have trouble with abstract concepts (AC), reading (R), vocabulary (V), math (M), and attention (A):	Building Maintenance	2	2	1	1	2	1.6
	Medical Assistant	-	-	-	-	-	-
	Graphics	1	2	3	1	3	2.0
	Dietetic Assistant	-	-	-	-	-	-
	Small Engine Repair	-	-	-	-	-	-
	Mean	1.5	2	2	1	2.5	1.8
		P	M	A			
I. 4. Extent to which VI's have trouble with print (P), motivation (M), and attitude (A):	Building Maintenance	1	4	4			3.0
	Medical Assistant	-	-	-			-
	Graphics	3	4	3			3.3
	Dietetic Assistant	-	-	-			-
	Small Engine Repair	-	-	-			-
	Mean	2.0	4.0	3.5			3.2
		A	M				
I. 5. Extent to which low-readers have trouble with attitude (A), and motivation (M):	Building Maintenance	3	4				3.5
	Medical Assistant	-	-				-
	Graphics	3	3				3.0
	Dietetic Assistant	-	-				-
	Small Engine Repair	-	-				-
	Mean	3.0	3.5				3.3

Teacher Survey Discussion. Despite the small sample size, the pre-revision surveys provided MLSP staff with useful data for initially defining the nature and course of the project, particularly when the mean scores by learning style and by program were reviewed. MLSP staff thoroughly considered most, if not all, of the variables on the Teacher Survey in determining the course of module production and revision. The pre-revision data also serve as a baseline for comparison to similar post-revision data.

As previously noted, the post-revision data concentrated on the written modules for Regular Vocational Education students only. In analyzing the post-revision data on the Teacher Survey of October, 1977, the following must be considered. In the Building Maintenance program one of the teachers had used approximately 56 revised modules and made responses on the survey with them in mind. The second teacher had used approximately 25 revised modules and did not consider them particularly when answering the questions on the survey, but treated the curriculum as a whole. In the Medical Assistant program the teacher responded considering the approximately 116 modules which had been implemented in the classroom. The Dietetic Assistant program had the highest number of revised modules in use, approximately 130, and teacher responses were "sometimes" made with the revised modules in mind. Both the Small Engine Repair and Graphics programs had implemented about 50 revised modules into the curriculum, with teacher survey responses based on the new modules.

Tables XIII and XIV provide a gross measure of the extent to which the teachers surveyed have had first hand experience in teaching the various learning styles. Thus they reflect the degree to which the observations that follow in the remaining tables are in fact grounded in reality. As is apparent, all teachers have had the most experience with Regular Vocational students, followed by Low Readers, Educable Mentally Impaired and Visually Impaired. Table XIV does not include the Physically Impaired category since the environmental modifications portion of the MLSP was transferred as noted on pages 6 - 8 of this report. The Building Maintenance and Graphics teachers have had the most experience with students with different learning styles.

Tables XV and XVI, which summarize Items B.1-3 on the Teacher Survey, show in the pre-revision data that generally speaking, students of all learning styles had some difficulty with the reading levels and vocabulary used in the five programs ($\overline{x} = 2.8$ and 2.4 respectively), especially in the Building Maintenance program ($\overline{x} = 3.3$ and 2.8). Reading level was also less than ideally appropriate in the Medical Assistant, Dietetic Assistant, and Small Engine Repair programs. EMI students apparently experienced the most academic difficulty as measured on these two items ($\overline{x} = 4.0$ and 3.3), followed in rank order by Low Readers, Visually Impaired, and Regular Vocational students.

While EMI's experienced the most academic difficulty prior to the MLSP, Table XV shows that Low Readers were most frustrated by the modules ($x = 1.8$), especially in the Medical Assistant, Graphics, and Small Engine Repair programs.

It is apparent in Table XVI, Item B.3, that frustration levels are very low for all learners, with the mean rising for Low Readers to 3.6. During field-testing little frustration was noted by the examiners.

From a strictly statistical standpoint, Table XVII illustrates that the clarity of the pre-revision modules constituted more of a problem than their levels of difficulty. EMI's in particular required clarification of instructions, explanation of concepts, supervision in completion, and extra help with problems and exercised ($\overline{x} = 1.0$). Second to EMI students were Low Readers, followed by Visually Impaired and Regular Vocational students. The programs which were least clear to students in rank order were: Building Maintenance, Medical Assistant, Small Engine Repair, Graphics and Dietetic Assistant. While it is true that modularized instruction frees considerable instructor time for dealing with the problems of individual students, the post-revision data in Table XVIII show a decrease in the amount of instructor clarification required, with the mean rising for all learning styles. To some degree these problems are inherent in the nature of these learning styles, and therefore unavoidable. Nonetheless, EMI performance was particularly scrutinized during the module field-tests to insure that all modules--particularly in the Building Maintenance program--were adequately clear to these students. Field-test results (cf. Table VII) show 93 percent of the EMI's found these modules easy to understand, supporting the data from the Teacher Survey. Because of content difficulty, EMI modules were not written in the Medical and Dietetic Assistant programs.

Tables XIX and XX, while less dramatic than the above tables, yield useful information. Item D.1 shows that teachers by and large feel that alternative teaching strategies are inherent in the modules only to a little extent. While this was a deficiency prior to the MLSP, the development of alternative modules for each learning style eliminates this need. The post-revision data show that less improvisation is required with the new curriculum ($\overline{x} = 2.3$ to $\overline{x} = 3.8$), thus saving valuable teacher time.

Table XXI, which relates to pre-revision module construction, indicates that, whereas the amounts of practice allowed (item E.1), feedback provided (item E.4), and repetition required (item E.2) in the modules were all within reasonable limits, there was a need for additional illustrations, which were reportedly present in the modules only to a little extent ($\overline{x} = 2.8$). This was most strongly evident in the Small Engine Repair, Dietetic Assistant, and Medical Assistant programs. However, this need was fully addressed by the MLSP and its contracted production staff which included a number of artists. The post-revision data in Table XXII reflects the addition of many illustrations, with teachers indicating they are now present to a great extent ($\overline{x} = 1.2$).

Tables XXIII and XXIV indicate that both pre- and post-revision modules have relevant examples (item F.2) and are job relevant (item F.4). In the pre-revision curriculum, EMI's are shown to lack understanding the rationale for the modules (item F.1), with a mean of 3.0. That the revised modules more clearly convey these rationales is shown in Table XXIV, (EMI $\overline{x} = 2.3$). A second area in need of attention during the module revision process was the communication of work values (item F.3), particularly in the Small Engine Repair modules ($\overline{x} = 4.0$). Post-revision data show an improvement ($\overline{x} = 2.0$).

Tables XXV - XXVIII support the philosophy of the CACC in general by indicating that both pre- and post-revision modules currently in use in all five programs reflect industry standards for job performance (item G.1), encourage student motivation (item H.1), and for the most part provide a positive learning experience for the student (item H.2). In keeping with previous data, EMI students have some difficulty with motivation, particularly as reported by the Graphics teacher.

Tables XXIX and XXX reveal that environmental modifications are needed to some extent for all five programs (item I.1). They further delineate specific areas of difficulty experienced by EMI, Visually Impaired, and Low Readers. The pre-revision data, as shown in item I.3, show that EMI's had considerable difficulty in Building Maintenance, Graphics and Small Engine Repair with, in order of decreasing value, abstract concepts, math/computation, attention, vocabulary and reading (data were not available for the Medical and Dietetic Assistant programs on this item because the Educable Mentally Impaired would not be able to obtain the content). Item I.3 post-revision data indicate the EMI's now have less difficulty with vocabulary and attention in the Graphics program. Visually Impaired students seem to have less severe difficulties, at least in terms of the variables in item I.4, in that they encounter problems with print, motivation, and attitude only to a little extent as reported for the Graphics and Small Engine Repair programs. Low Readers, however, did have problems in the pre-revised curriculum with motivation ($\bar{x} = 1.8$) as well as with attitude ($\bar{x} = 2.5$), especially in the Small Engine Repair, Medical Assistant, and Building Maintenance programs (item I.5). Post-revision data point to improvement in both attitide ($\bar{x} = 3.0$) and motivation ($\bar{x} = 3.5$).

From a review of noteworthy items and indices of Tables XIII - XXX, a pattern emerges in which EMI's on the average experienced the most difficulty with the pre-revised modules, followed by Low Readers and Visually Impaired students. A summary of these items follows in Table XXXI, which presents questions which clearly indicate differences among students of various learning styles.

Table XXXI. Summary of Selected Items From Teacher Survey, January 1977

Item/Index	Learning Style (in rank order)
B.1 - B.2. Reading level and vocabulary are least appropriate to:	EMI, LR, VI, RVE
B.3. Current modules are most frustrating to:	LR, EMI, RVE, VI
C.1-3. Current modules require most clarification, explanation, and supervision for:	EMI, LR, VI, RVE
H.1. Students least motivated to complete modules are:	EMI, VI, LR, RVE
I.3-5. Students who in general experience most problems are:	EMI, LR, VI

Key: EMI = Educable Mentally Impaired
VI = Visually Impaired
LR = Low Readers
RVE = Regular Vocational Education

It is clear from the above table that EMI's in particular would benefit from instructional material designed to meet their special needs. Also of interest in this table is the positioning of Visually Impaired students toward the end of the rank order sequences. This seems to indicate that these students tend to suffer more from their physical handicap than from either lack of native ability or attitudinal problems.

An examination of Table XXXII shows little variation in the rank orders; another indication that the variables selected from the survey relate to problems which are inherent in the nature of the learning styles. Nevertheless, the cumalative data show enhanced achievement for all learning styles in all five programs selected for revision.

Table XXXII. Summary of Selected Items From Teacher Survey, October 1977

Item/Index	Learning Style (in rank order)
B.1-B.2. Reading level and vocabulary are least appropriate to:	EMI, LR, RVE, VI
B.3 Current modules are most frustrating to:	EMI, VI, LR, RVE
C.1-3. Current modules require most clarification, explanation and supervision for:	EMI, LR, RVE, VI
H.1. Students least motivated to complete modules are:	EMI, LR, RVE, VI
I.3-5. Students who in general experience most problems are:	EMI, LR, VI

Key: EMI = Educable Mentally Impaired
VI = Visually Impaired
LR = Low Reader
RVE = Regular Vocational Education

Finally, in January, 1978, VIA, Inc. solicited teacher opinion about the post-revision curriculum. Following are some of their comments:

> I have found that students understand the modules with less instructor input. The illustrations have reduced the amount of time students need to do the modules. The cartoons are appreciated by the students; they help relieve the tedium. I had not anticipated this. Placing the technical words on the page where they appear has increased students' understanding.
>
> The revised modules are now improved to a great extent in the EMI and Low Reader categories. The illustrations seem to work very well, especially with students who cannot read at all.
>
> The revised modules are easier to read and to understand. The students like the illustrations which help the students to complete the job steps. I think the revised modules are very effective for teaching the skills in this program.

> I feel the MLSP modules are a big improvement for all the students. In the majority of the modules the reading level was lowered so the modules are much better understood. The most important single improvement was the addition of simple drawings and pictures to be used with every one or two job steps. Before the MLSP, most modules did not have any pictures, now they all have 10 to 20 pictures each. Most are very good and show details accurately. The slow readers can almost do the module from looking at the pictures. I have noticed an improvement in the motivation level of all students with the new MLSP modules and a decrease in the questions they ask me about the modules. There are four slide/tapes in progress for some difficult modules. I feel that these may be the best way to teach some of the many hand-skill type modules that are difficult to put into words.

It is evident from these remarks that the MLSP has strong teacher support and appreciation.

Student Change of Goal Rates, Drop Out and Absentee Rates. The next two tables present Change of Goal Rates from the MLSP Data Summary Sheets which summarize selected information from the CACC computer system.

TABLE XXXIII.
PRE-REVISION
CHANGE OF GOAL RATE
1976-77
3rd Quarter

OCCUPATION	IN-PROGRAM				OUT OF PROGRAM			
	RV	VI	NR	EMI	RV	VI	NR	EMI
GRAPHICS								
DUPLICATING MACHINE OPERATOR	–	–	–	–	–	–	–	–
PRESS OPERATOR	–	–	–	–	–	–	–	–
FINISHING TECHNICIAN	–	–	–	–	–	–	–	–
CAMERA	–	–	–	–	–	–	–	–
COMPOSITOR	–	–	–	–	–	–	–	–
BUILDING MAINTENANCE								
CUSTODIAN	–	–	–	–	–	–	–	–
BUILDING MAINTENANCE	–	–	–	–	–	–	–	–
HOSPITAL CUSTODIAN	–	–	–	–	–	–	–	–
BUILDING ENGINEER	–	–	–	–	–	–	–	–
CARPET MAINTENANCE	–	–	–	–	1	–	–	–
SMALL ENGINE REPAIR	–	–	–	–	–	–	1	–
MEDICAL ASSISTANT	–	–	–	–	–	–	–	–
DIETETIC ASSISTANT	–	–	–	–	–	–	–	–

TABLE XXXIV.

POST-REVISION

CHANGE OF GOAL RATE

1977-78

1st Quarter

OCCUPATION	IN-PROGRAM				OUT OF PROGRAM			
	RV	VI	NR	EMI	RV	VI	NR	EMI
GRAPHICS								
DUPLICATING MACHINE OPERATOR	1	-	-	-	-	-	-	-
PRESS OPERATOR	-	-	-	-	-	-	-	-
FINISHING TECHNICIAN	-	-	-	-	-	-	-	-
CAMERA	-	-	-	-	-	-	-	-
COMPOSITOR	-	-	-	-	-	-	-	-
BUILDING MAINTENANCE								
CUSTODIAN	2	-	-	-	-	-	-	-
BUILDING MAINTENANCE	-	-	-	-	-	-	-	-
HOSPITAL CUSTODIAN	-	-	-	-	-	-	-	-
BUILDING ENGINEER	1	-	-	-	-	-	-	-
CARPET MAINTENANCE	-	-	-	1	-	-	-	-
SMALL ENGINE REPAIR	-	-	-	-	-	-	1	-
MEDICAL ASSISTANT	-	-	-	-	-	-	-	-
DIETETIC ASSISTANT	-	-	-	-	-	-	-	-

Student Drop Out Rates were computed from the Data Summary Sheets (see Appendix U), and consist of percentages of the number of drop outs in each program ÷ total number enrolled in the program. Likewise, Student Absentee Rates are simply the percentage of time students were absent in a given program.

The ensuing tables present the pre- and post-revision Drop Out and Absentee Rates.

Table XXXV. Pre-Revision Drop Out Rates

Program	Drop Out Rate (%)				Mean
	EMI	VI	LR	RVE	
Building Maintenance	0	-	11.1	12.5	9.4
Medical Assistant	-	-	0	14.7	14.3
Graphics	0	0	0	0	0
Dietetic Assistant	-	-	-	-	18.1
Small Engine Repair	0	0	20.0	33.3	30.3
Mean	0	0	9.1	15.3	13.4

Key: EMI = Educable Mentally Impaired
VI = Visually Impaired
LR = Low Reader
RVE = Regular Vocational Education

TABLE XXXVI. POST-REVISION STUDENT DROP OUT RATES

Program	Drop Out Rate (%)				Mean
	EMI	VI	LR	RVE	
Building Maintenance	33.3	-	25.0	16.7	25.5
Medical Assistant	-	-	0	5.1	2.5
Graphics	-	-	0	5.4	2.7
Dietetic Assistant	-	-	0	15.4	7.7
Small Engine Repair	-	-	41.6	9.6	25.6
Mean	33.3	-	13.3	10.4	12.7

Key: EMI = Educable Mentally Impaired
VI = Visually Impaired
LR = Low Reader
RVE = Regular Vocational Education

TABLE XXXVII. PRE-REVISION STUDENT ABSENTEE RATES

Program	Absentee Rate (%)		Mean
	AM	PM	
Building Maintenance	19.7	9.8	15.0
Medical Assistant	15.5	17.4	16.3
Graphics	10.7	9.0	16.3
Dietetic Assistant	13.4	-	13.4
Small Engine Repair	16.0	12.8	14.2
Mean			13.8

TABLE XXXVIII. POST-REVISION STUDENT ABSENTEE RATES
(First Quarter 1977 - 78)

Program	Absentee Rate (%)		Mean
	AM	PM	
Building Maintenance	8.25	5.6	6.9
Medical Assistant	4.9	5.7	5.3
Graphics	6.7	8.3	7.5
Dietetic Assistant	2.4	-	2.4
Small Engine Repair	9.6	8.8	9.2
Mean			6.38

Discussion. Like the Teacher Survey data, the information on Tables XXXIII - XXXVIII is useful when comparing identical pre- and post-revision data. However, certain remarks are in order. It should be kept in mind that the above data are qualified by the small sample size (pre-reivison: n= 149, total handicapped population = 31; post-revision: n = 154, total handicapped population = 23. For a complete breakdown see Tables IV and V). It should also be recalled that only revised Regular Vocational Education modules had been implemented at the time of post-revision data collection.

Table XXXIII shows that two students changed their goal; dropping out of Building Maintenance and Small Engine Repair but entering other programs within the CACC ($\bar{x}$ = 1.3). No students were added to any of the five programs under revision ($\bar{x}$ = 0). Table XXXIV depicts only one student dropping out of Small Engine Repair ($\bar{x}$ = 1.2). However, four students entered the Building Maintenance program and one student was added to the Graphics program ($\bar{x}$ = 3.2). Thus there is a small increase in the number of students who entered programs that have been revised as a result of the MLSP.

On Table XXXV, pre-revision Student Drop Out Rates are found to be highest in the Small Engine Repair program ($\bar{x}$ = 30.3%), followed by Dietetic Assistant ($\bar{x}$ = 18.1%), Medical Assistant ($\bar{x}$ = 14.7%), Building Maintenance ($\bar{x}$ = 9.4%) and Graphics ($\bar{x}$ = 0%). However, the small sample size affected these scores considerably and the post-revision data was not expected to show consistency.

On Table XXXVI, the Student Drop Out rates are highest in Small Engine Repair ($\bar{x}$ = 25.6%) and Building Maintenance ($\bar{x}$ = 25.0%), followed by Dietetic Assistant ($\bar{x}$ = 7.7%), Graphics ($\bar{x}$ = 2.7%) and Medical Assistant ($\bar{x}$ = 2.5%). As predicted, the means for pre- and post-revision Drop Out Rates show little significant difference ($\bar{x}$ = 13.4 vs. $\bar{x}$ = 12.7).

More internal consistency is shown on Tables XXXVII and XXXVIII which measure Student Absentee Rates. Pre-revision rates average 13.8% and range from 13.4% (Dietetic Assistant) to 16.3% (Medical Assistant and Graphics). Post-revision rates are less homogeneous, ranging from 9.2% (Small Engine Repair) to 2.4% (Dietetic Assistant) and average 6.4%. The overall lower absentee rate, especially in the Dietetic Assistant program which had implemented the greatest number of revised modules in the fall of 1977, would indicate that students more motivated to attend classes have a more positive learning experience using the revised curriculum.

4. SUMMARY. The data analyses conducted by the third party evaluators substantiate the conclusion that the Multiple Learning Strategies Project has achieved its stated goal to a large extent (cf. page 2).

That the revision of 1319 identified modules for the Building Maintenance, Dietetic Assistant, Medical Assistant, Small Engine Repair and Graphics programs with alternative learning strategies has enhanced the achievement of Educable Mentally Impaired (EMI), Visually Impaired, Low Readers and Regular Vocational Education students is supported by field-test data, content analysis, Sex and Minority Panel reports, and Teacher Survey results.

Field-test data indicate very little variation in the success of students of the various learning styles. This suggests that the MLSP is in face achieving its objective of facilitating the learning processes of Low Readers and EMI students so that they approximate those of Regular Vocational Education students.

The content analyses of the five programs verify that MLSP staff adequately addressed the needs expressed on the Module Analysis Cards and have employed different learning strategies that will benefit all the student populations. Overall quality of the modules is very good.

The sub-contracted Sex and Minority Panel report concluded: "It is evident that the illustrators and authors for all of the modules we have evaluated have tried very hard to avoid any sex bias and to portray women and minorities in non-traditional roles. With very small exception they have succeeded."

The cumulative data collected from the post-revision Teacher Surveys show increased achievement for all learning styles as well as increased instructor satisfaction with the revised curriculum.

The manuals on environmental manipulations, including the job profile, the occupational physical profile, and the adaptation guidelines for the physical skills and required working conditions appropriate to the occupation, provide a model for use by special education and vocational educational teachers everywhere who are similarly combining the two areas.

The MLSP has been ably managed and in its entirety, provides a strong model (for replications) of the compatibility of Special Education and Vocational Education.

Final Recommendations. VIA, Inc. recommends continued field-testing of programs revised as a result of the state funded expansion of the MLSP. In addition, teachers should be encouraged to continue using the Revision Recommendation Form which will provide ongoing feedback to staff members for continued module refinement.

FOOTNOTES

[1] MLSP Proposal, December, 1975, p. 19.

[2] *Ibid.*, in Proposal Abstract.

VII. BIBLIOGRAPHY

The bibliographical information which formed the substance of research into the special learning styles of each group in the vocational student population accompanies the respective profiles of each group (see Appendix E). The following general bibliography represents the literature specifically addressing the need to mainstream handicapped students in vocational programs, as well as the theory of communication adopted by the Multiple Learning Strategies Project for both research design and adaptation into learning materials.

Berlo, David K., The Process of Communication, Holt, Rinehart, Winston: New York, 1960.

Danford, Jan, "Evaluating Instructional Materials," Module 10 of the Module Project, College of Education, Wayne State University, March, 1976.

Education for All Handicapped Children Act of 1975, Public Law 94-142. Washington, D.C.: U.S. Government Printing Office, 1975.

Mainstreaming: Planning for a Pre-Service Program in Vocational, Industrial Arts and Physical Education, College of Education, Michigan State University, August, 1976.

Reynolds, et al, "A Project to Train Vocational Education and Special Education Teachers to Work Cooperatively in Occupational Preparation of Handicapped Persons," Central Michigan University, Mount Pleasant, Michigan, 1974.

Sullivan and Guikema, "Project Extension," Ingham Intermediate School District, Mason, Michigan, 1975.

VIII. APPENDIXES

APPENDIX A: TEACHER SURVEY

Name: ______________________ Program(s) ______________________

____

Date: ____________________

Introduction: The purpose of this survey is to determine the numbers and types of revisions needed in five CACC programs to address the special needs of Educable Mentally Impaired (EMI), Visually Impaired (VI), Non-reading (NR), Regular Vocational Education (RVE), and Physically Impaired (PI) students. The five programs under investigation are Building Maintenance, Small Engine Repair, Graphic Arts, Medical Assistant, and Dietetic Aide. The results of this survey will be compared to similar information obtained in the fall of 1977 and used to assess, in part, the impact of the Multiple Learning Strategies Project.

A. General Information

1. Please mark the number of students you have had in the appropriate spaces below by handicap and by program or occupation.

	EMI	VI	NR	RVE
Building Maintenance				
Custodian				
Building Maintenance				
Hospital Custodian				
Building Engineer				
Carpenter Maintenance				
Small Engine Repair				
Graphic Arts				
Duplicating Machine Operator				
Press Operator				
Finishing Technician				
Cameraman				
Compositor				
Medical Assistant				
Dietetic Aide				

B. Levels of Difficulty

1. To what extent is the reading level in your program appropriate to:

   EMI______ VI______ NR______ RVE______

   (Put appropriate letter response in blank)

   a. to a very great extent
   b. to a great extent
   c. to some extent
   d. to a little extent
   e. to a very little extent

2. To what extent is the vocabulary now appropriate to:

   EMI______ VI______ NR______ RVE______

   (Use letter choices given in question #1.)

3. To what extent do the modules currently in use frustrate students:

   EMI______ VI______ NR______ RVE______

4. To what extent are students now able to succeed and/or have a positive learning experience:

   EMI______ VI______ NR______ RVE______

C. Clarity

1. To what extent do students require additional clarification of instructions?

   EMI______ VI______ NR______ RVE______

2. To what extent do students require supervision in completing the steps in the modules you are currently using?

   EMI______ VI______ NR______ RVE______

3. To what extent do students require additional explanation of concepts presented in the modules?

   EMI______ VI______ NR______ RVE______

(Responses: a. to a very great extent
b. to a great extent
c. to some extent
d. to a little extent
e. to a very little extent)

4. To what extent do students require additional help with problems/exercises:

EMI______ VI______ NR______ RVE______

D. Teaching Strategies

1. To what extent are alternative teaching strategies inherent in the modules currently in use?

EMI______ VI______ NR______ RVE______

2. To what extent is improvisation required of the teacher using the existing modules?

EMI______ VI______ NR______ RVE______

E. Module Construction

1. To what extent is adequate practice allowed in the modules you are currently using?

EMI______ VI______ NR______ RVE______

2. To what extent must students repeat the modules?

EMI______ VI______ NR______ RVE______

3. To what extent are adequate illustrations present in the modules currently in use?

EMI______ VI______ NR______ RVE______

4. To what extent do the current modules provide adequate feedback for students?

EMI______ VI______ NR______ RVE______

(Responses: a. to a very great extent
b. to a great extent
c. To some extent
d. To a little extent
e. to a very little extent)

F. Module Transference

1. To what extent are the students able to understand the rationale for the modules currently in use?

EMI______ VI______ NR______ RVE______

2. To what extent are the examples given in the modules relevant to students' chosen occupations?

EMI______ VI______ NR______ RVE______

3. To what extent do the modules convey work values to:

EMI______ VI______ NR______ RVE______

4. To what extent are the current modules job relevant?

EMI_____ VI______ NR______ RVE______

G. Module Standards

1. To what extent do the current modules reflect and/or meet industry standards for job performance?

EMI______ VI______ NR______ RVE______

H. Student Interest

1. To what extent are students motivated to complete the modules?

EMI______ VI______ NR______ RVE______

I. General Questions

1. To what extent is adequate "hands on" experience given as part of learning the modules?

EMI______ VI______ NR______RVE______

2. To what extent are environmental modifications required in your program for physically impaired students?

EMI______ VI______ NR______ RVE______

3. What kinds of environmental modifications do you recommend for each occupation in your program?

4. To what extent do EMI's have trouble in your program with:

abstract concepts ______

reading ______

vocabulary ______

math/computation ______

attention ______

Other:

5. To what extent do VI's have trouble in your program with:

print ______

motivation ______

attitude ______

Other:

6. To what extent do non-readers have trouble with:

attitude ______

motivation ______

failure set ______

Other:

APPENDIX B

Name: ______________________________

Date: ______________________________

STUDENT MODULE EVALUATION - 1

Unit: __________ Module: ____________________________ Program: _________________________

	YES	SOMETIMES	NO
1. This module is easy to read.	________	________	________
2. This module is easy to understand.	________	________	________
3. The steps in this module are easy to follow.	________	________	________
4. The pictures are helpful.	________	________	________
5. The module has enough information so that I can perform the skill.	________	________	________
6. I was able to do the problems and exercises in this module.	________	________	________

7. This module could be better if ____

____

____

This module is:

a. Very good
b. Good
c. Fair
d. Poor

STARTING TIME:

FINISH TIME:

Appendix C

AMOUNT OF R[illegible](1-5)______ **Module Analysis**

Number of Modules:______

Program:______

Unit:______

Module:______

Present Message:

______Reading______

______Graphics______

______Audio-Visuals______

______Practice______

______Technical Words______

Analyzed Message:

______Reading______

______Graphics______

______Reading-Audio______

______Audio-Only______

______Audio-Visuals______

______Practice______

______Practice-Audio______

______Technical Words______

GROUP: EMH

MESSAGE:	Date Com.	Cost
______Reading	______	______
______Graphics	______	______
______Reading-Audio	______	______
______Audio-Only	______	______
______Audio-Visuals	______	______
______Practice	______	______
______Practice-Audio	______	______
______Technical Words	______	______

GROUP: VISUALLY IMPAIRED

Message:	Date Com.	Cost
______Reading	______	______
______Graphics	______	______
______Reading-Audio	______	______
______Audio-Only	______	______
______Audio-Visuals	______	______
______Practice	______	______
______Practice-Audio	______	______
______Technical Words	______	______

GROUP: REGULAR VOCATIONAL EDUCATION

MESSAGE:	Date Com.	Cost
______Reading	______	______
______Graphics	______	______
______Reading-Audio	______	______
______Audio-Only	______	______
______Audio Visuals	______	______
______Practice	______	______
______Practice-Audio	______	______
______Technical Words	______	______

GROUP: NON-READERS

MESSAGE:	Date Com.	Cost
______Reading	______	______
______Graphics	______	______
______Reading-Audio	______	______
______Audio-Only	______	______
______Audio Visuals	______	______
______Practice	______	______
______Practice-Audio	______	______
______Technical Words	______	______

Sex Bias Analysis:	YES	NO
Equal Male/Female Representation (Graphically)	______	______
Equal Male/Female Pronoun Usage	______	______
Sex Stereotyping of Traits i.e.		
Females are dependent, passive, afraid of noises	______	______
Comments that demean or deride women	______	______

REVISION SYSTEM

Module ____________________

This is module __________ of
modules ________ through ______

PERFORMANCE CRITERIA	REGULAR VOCATIONAL YES	NO	NON READERS YES	NO	EMI YES	NO	VISUALLY IMPAIRED YES	NO

APPENDIX D

REASONS FOR DIFFICULTY

ESTIMATED TIME FOR COMPLETION:

APPENDIX E

CONTENTS

I. COMPLETE PROFILES:

- Regular Vocational Education Students
- Low-Reading Students
- Visually Impaired Students
- EMI (Educable Mentally Impaired) Students

II. Graphic Short-form of Profiles.

III. Treatment Profiles

Regular Vocational Education Students

Prelude

Most of the data contained in this report may be considered, at least in one respect, to be redundant. That regular Vocational Education High School Students are largely Normal, may be gleaned from the following statistics.

In school year 1972-73, 42.6% of all public school students in grades nine through twelve were reported enrolled in Vocational Education courses. (In Michigan, this figure was 28.5%). Of the total vocational education population, only 13.1% were labeled as disadvantaged and a mere 1.8% were labeled as handicapped. (Michigan percentages: Disadvantaged - 2.27%, Handicapped - 1.03%) ⑨

Despite the presumption of Normality in Vocational Education high school students, the data presented must not be viewed as descriptive of the typical vocational education student, but rather as descriptive of typical vocational education graduate. It is this population which has been studied.

The study of students who graduate from vocational high school programs has proved to be easier than any alternative approach since there is some evidence to indicate that the typical "dropout" is likely to transfer from either the vocational or academic curriculum into the general curriculum of a comprehensive high school and possibly drop out of school altogether from there. ⑧ Approximately 35% of the students enrolled in high school fail to graduate. This figure appears to be about 5% to 7% lower among Vocational Technical high school students than among other secondary pupils. ⑫*

Interestingly enough, no study has been located which attempts to describe the differential abilities of high school boys and girls enrolled in vocational education courses. Quite likely, this is because the U.S. Office of Education has dropped its requirements for designation by sex in reporting enrollments. For school year 1971-72, the last year in which any such data were available, males comprised 44.5% of the total vocational education enrollment, while females comprised 55.5%. ⑨

*The apparent reason for this difference is that Vocational Education is better able to accomodate children with lower verbal abilities and less interest in traditional academic subjects. In addition, potential dropouts would seem to receive excellent modeling from other Vocational Education students, since this population displays less "acting out" type behaviors and greater propensity to "stick-it-out" than other high school students.

Profile of Regular Vocational Students

Subject	Profile	Treatment
OMMUNICATION SKILLS		
Listening Skills	Is approximately at the 41st. percentile in terms of general word knowledge, or -1 grade level. ⑥ ⑦ Females are superior to males in general word knowledge. Males are superior to females in more technically oriented words. Males are better listeners than readers; discrepancy is about .5 grade levels.	To increase comprehension for males, utilize verbal as opposed to written instruction wherever or whenever possible. To increase comprehension for females, utilize written as opposed to verbal instruction wherever or whenever possible.
Speaking	Is approximately at the 39th. percentile in terms of verbal expression or -1 grade level. (mean verbal aptitude = 4.46, standard deviation = 1.84)	Since verbal comprehension appears to be at the 41st. percentile while verbal expression appears to be at the 39th. percentile, these abilities would appear to vary together. A general verbal deficiency appears more likely than specific expressive problems. Program in the training sequence the rephrasing of messages into clear, concise terms (this could also be an exercise for the student to translate job steps into their own language).
Reading	Possesses a deficient sight word repertoire thus handicapping the student from effectively dealing with the reading requirements or, is -2.6 grade levels (in reference to vocational education materials). ⑩	
Silent Reading	Is below academic students in reading comprehension; difference is significant at the .01 confidence level.	

	Vocational Program	Academic Program
Mean Reading Comprehension	4.02	4.77
Standard Deviation	1.93	2.09

④

Multiple Learning Strategies Project
Capital Area Career Center
Mason, Michigan

Profile of Regular Vocational Students

Subject	Profile	Treatment
OMMUNICATION SKILLS		
Reading		
Silent Reading - Cont.	Females are superior to males in reading comprehension. This superiority decreases as the students progress from grades 9 through 12. ⑥ Males are approximately at the 36th. percentile or -1.5 grade levels in reading comprehension. Females are approximately at the 45th. percentile or -.5 grade level in reading comprehension.	Vocational text levels and student's reading comprehension levels were frequently found inconsistent. Texts used in vocational courses were judged as unnecessarily complex as well as dull and uninteresting. Revise texts so as to be in line with on-the-job reading requirements. ⑤ ⑩ To increase comprehension, place important concepts/words in simple, explanatory sentences prior to assignment of text reading. ⑪ Simplest method of improving reading is simply to provide material at the student's instructional level. This level is defined as the highest level where oral reading is at least 90% error free and comprehension is at least 75%.
Writing		
Ability in Revisualization	Is significantly below academic students in revisualization, but approximately at the 48th. percentile when compared to all high school students. (Test used was "Memory for Sentences".) ⑥ ⑦	
	Writing is rated as the area of greatest weakness (by teachers). ④ Is approximately at the 38th. percentile in terms of a combined assessment of spelling, capitalization, punctuation, english usage, and effective expression or -1.0 grade level over-all. Males are approximately at the 29th. percentile or -2 grade levels. Females are approximately at the 48th. percentile or approximately at grade level.	Most frequently recommended approach for improving all academic skills including writing, is a cross-discipline team teaching situation. Typical team members include technical instructor, science teacher, math teacher, english teacher and guidance counselor. ⑩ ⑫

Profile of Regular Vocational Students

Subject	Profile	Treatment
OMMUNICATION SKILLS		
Writing		
Thought Processing Variables	Is approximately at the 41st. percentile in terms of non-verbal reasoning. ⑥ ⑦	Visual input is generally more effective than verbal input.
	Is approximately at the 47th. percentile in devising solutions to practical problem (judged by test of creativity which is aimed at reasoning ability). ⑥ ⑦	Transfer will not spontaneously occur. Will need to program for transfer by a step-wise arrangement of materials, problems, or questions.
Mathematics	Males are approximately at the 51st. percentile or +.5 grade level in math aptitude. Females are at the 45 percentile or -.8 grade level in math aptitude.	Discrepancy between math comprehension and computational accuracy cannot be sufficiently explained, however it is more distinct than differences shown by academic students. Vocational math books provide a great deal of practice with computation on trivial problems while neglecting math concepts. ⑤
	Males are only 76% as quick and accurate as the average high school student in computation. Females are spproximately 90% as quick and accurate in computation as the average high school student.	
NOWLEDGE LEVEL		
Intelligence	Deviation IQ is at 98 (mean = 100, S.D. = 15, stanine = 4.68). ④	
	Non-language IQ is significantly above language IQ (CMMT, N = 312). ③	
Achievement	Reading and IQ r = .58; suggests that reading achievement is below what would be expected for an IQ of 98. ④	
	Math and IQ r = .53 for math achievement and .52 for math aptitude; suggests that math achievement and comprehension are below what would be expected for an IQ of 98. ④	

Profile of Regular Vocational Students

Subject	Profile	Treatment
OWLEDGE LEVEL		
Attention	Was rated by teachers as more attentive than their academic peers. ④	Attention is thought to be a chain of responses performed in the presence of a learned set of signals (either verbal or visual). Signals to be taught include the following: A. Attention Signals 1. Indicate who is to attend to the teacher when, and often indicate which sense modalities should be used. 2. The teacher should vary the length of time between presentation of attention signals and performance of the teaching routine in order to increase attention, e.g. "class, listen; Mary, look". B. Task Signals 1. Involve presentation of the stimulus which will require a response. 2. Always requiring some subsequent response from one or more class members will generally insure orientation to the stimulus, e.g. walking over to a machine. C. Stimulus Directions Specify which sensory modality (or modalities) should be directed toward which aspects of the task signal e.g."look at this fan belt". D. Stimulus Prompts When needed, aid in the discrimination of relevant from non-relevant stimuli, e.g. "You can see that the belt is raveled at the edges". E. Response Directions Indicate the general form of the required response(s), e.g. "Can you tell me if this belt needs replacement?" "A twenty question true-false test will be given on this material at 10:30 today"

Subject	Profile	Treatment
NOWLEDGE LEVEL		
Attention-Continued		F. Response Prompts When needed, cue the student that a previously acquired response is appropriate to this task signal. Such a procedure helps get the response going and can be faded at a later point, e.g. "Do you remember what you learned about drive belts?". G. "Do It" Signals 1. Specify who is to respond when. 2. Words like "when?" "What?" "Where?" "Why?" and "Who?" can function as 'do it' signals. So can calling on a student by name. Phrases such as "your turn" or "tell me", hand signals, head nods, or voice inflections.
Retention Memory		
Immediate Recall	Is approximately at the 48th. percentile in terms of immediate recall. ⑥ ⑦	
Transfer of Training	Is approximately at the 47th. percentile in their ability to use previously acquired information for purposes of solving current problems. ⑥ ⑦	
	General performance is better in all vocational education courses than in any academic courses. ④	Suggests that the structure, format, and subject matter of academic courses may function as aversive stimuli inhibiting transfer. Must attend to those factors to promote transfer. The single factor most important to principle application is "concept teaching".

Profile of Regular Vocational Students

Subject	Profile	Treatment
KNOWLEDGE LEVEL **Transfer of Training - Continued**		This involves presentation of a sufficient number of "instances" and "not instances" of a stimulus class that the learner is able to identify those characteristics which are essential for discriminating that class from all others. Factors that promote generalization over situations. ② 1. The single factor most likely to promote generalization is the "response prompt" a direct reminder that some previously acquired response is appropriate in the current situation. 2. Prompts should be faded as soon as possible, e.g. successively less noticable prompts should be given until the new situation itself will cue the response.
Practice		Opinion: Vocational education students receive a great deal of practice in rote performance of mundane tasks without teaching of the associated concepts. ⑥
Physical Status	No difference with respect to strength, balance, hearing and vision.	
Channels of Receiving Information Visual Presentation	-Low-normal functioning is typical in reading material.	Pictoral presentation should be relevant and arranged so as to call for active responding. This format may represent optimal single channel presentation. Lecture-type presentation without calling for feedback from the student could result in misunderstanding of information. Opportunity for immediate feedback from student increases likelihood of effective communication and teaching.

Profile of Regular Vocational Students

Subject	Profile	Treatment
NOWLEDGE LEVEL		
Channels of Receiving Information - Continued Visual Presentation		Inability of tape presentation to attend to or compensate for student misunderstanding increases the risk of the use of this procedure. "Compressed Speech" option available with certain units, appears to enhance learning. Program for tape presentation that will provide directions for psycho-motor tasks.
Auditory Presentation	Tape presentations seem to be most effective when used to provide directions for psycho-motor (Listen and do) tasks. ⑬ Verbal comprehension is at the 41st. percentile. Reading comprehension is at the 36th. percentile for males and at the 45th. percentile for females.	The danger is that students will simply listen to tape without reading along. This can lead to incomplete learning or misunderstanding of material. Advantages are in the increasing of word knowledge, sight vocabulary and reading comprehension. To be most effective, materials should be at or slightly above student's present level of reading comprehension. Note: Provision should be made for continuous monitoring of the student's ability to read and comprehend the utilized materials without relying on the tape. Taped lessons would be effective in increasing sight vocabulary or technical vocabulary.
Factual-Experimental Presentation		Use of experimental presentation is effective when used in group composed of only vocational education students, but somewhat questionable when the group is a mixture of vocational and academic students. ④

Profile of Regular Vocational Students

Subject	Profile	Treatment
NOWLEDGE LEVEL		
Effects of Presentation Styles		
Serial Learning Tasks	Performs equally well whether exposed to "forward" or "backward" chaining techniques.	Physical, work-oriented tasks would appear to allow for live or filmed modeling procedures which would make use of the student's strong visual sense.
Sorting	Adequate performance in any sorting task, both simple or overlapping. ⑥ ⑦	
TTITUDES TOWARD SELF & OTHERS		
General Appraisal of Self	Rated themselves on yes-no short answer responses: 1)Lower self-concepts of academic ability than non-vocational students. 2)Had equal self-concepts of vocational ability. ⑮	
	In an interview situation utilizing open-ended questions, 66% of vocationally oriented high school graduates were unable to make any expressive statements about self.	Explanations included: 1)Lack of appropriate guidance. ① ③ 2)Immaturity, particularly in the area of verbal development. ③
General Acceptance of Handicaps	Perceived and lower academic abilities are in conflict with perceived vocational competencies. ① ⑫	Because of difficulty in reading and math, students are questioning the seriousness of educational and/or occupational objectives. ⑫
	Typical reactions to this state of affairs appears to be: Student blaming of the Guidance Counselor and/or self, followed by resignation. ① ⑫	Constructive solution would be: 1)A frank discussion of the issues involved 2)Offering of courses which will help the student "catch up".

Profile of Regular Vocational Students

Subject	Profile	Treatment
ATTITUDES TOWARD SELF & OTHERS		
General Evaluation of How Students Use Material and Equipment	Appears that generally the student will present few problems with respect to the use of material and equipment. ④	

Possible Problems With Vocational Educational Students	Reported Frequency of Problems			
	Daily	Often	Seldom	Never
Poor Quality Shop Work	2.6%	24.3%	59.1%	14.0%
Poor Housekeeping	3.4%	26.4%	45.1%	25.1%
Wastage of Supplies	2.5%	20.7%	52.9%	23.8%
Classroom Horseplay	5.0%	15.6%	55.4%	24.1%
Damage to Equipment	1.1%	10.0%	53.8%	35.1%

(Ratings by 900 Vocational Education Teachers)

Subject	Profile	Treatment
Ability to Function Under Stress and/or Frustration	Factors which are indicative of "adjustment": 1)Experiences fewer suspensions from school 2)Drop-out rate is lower 3)Fewer parental contacts for disciplinary problems 4)More frequently absent from school	
Achievement Motivation	Vocational Education teachers rated their students: 8% Rated their classes low 59% Rated their students average 33% Rated their students high (c) Motivational level was lower in academic classes. ④	Procedures should involve team teaching and shop laboratory approaches where students are given an opportunity to solve technological problems similar to those encountered in industry. ⑩ ⑫
Perceived Level of Freedom to Participate in Valued Activities	Take part in fewer extracurricular activities than academic students. ④ (c) A higher percentage of male vocational education students feel it is difficult to take part in extracurricular activities than do male academic students, male general students, or females from any curriculum. ⑧	

(c) Students in comprehensive high schools

Subject	Profile	Treatment
ATTITUDES TOWARD SELF & OTHERS		
Failure Set Pattern	(c) Feel they are less academically able than others. ⑮	An approach used previously with success is the Coordinated Guidance System (CGS) ⑫ This is a group based self-guidance technique utilizing a member of the school staff as a permissive collaborator. The students go through the process of exploring self, education, and work.
Perception of Others		
Students Perceptions of Others	(c) A greater percentage of Vocational education males felt that other students or teachers 'looked down' on them because of the courses they took. ⑧ (c) Non-college-bound vocationally oriented students reported a significant incidence of the following perceptions: ① 1. The school, counselors and faculty are seen as favoring the college-bound population. 2. Counselors were not perceived as being at all helpful, but seen as disciplinarians, not available, too busy, too involved with college-bound students, or simply unknown. 3. Parents were seen as not being especially helpful in resolving personal, educational or vocational problems and concerns.	
C: Students in comprehensive high schools		

Subject	Profile	Treatment
ATTITUDES TOWARD SELF AND OTHERS		
Others Perceptions of Students	Viewed favorably by the majority of vocational education teachers. Academic teachers tend to see vocational education students as "troublesome" due to insufficient academic skills and supposed propensity for discipline problems. ④ (c) Teachers rated vocational training low and are skeptical of its effectiveness. ⑫ A significant incidence of the following perceptions reported among high-school age adolescents: 1 (Comparison between college-bound and non-college bound) 1. Non-college bound peers are viewed as undesirable models. 2. Non-college bound peers are seen as followers and not favored by the Establishment. 3. College-bound peers are seen as receiving the best efforts of the school and non-college-bound peers are viewed as receiving whats left.	
Ability and Reactions of Students Authorities	Frequency of disciplinary problems less than among Academic students ④ Fewer contacts with Guidance personnel for either course or job planning than among other groups ⑧	Programs allowing for direction and planning through exploration of self and opportunities within the context of a peer oriented culture should be encouraged. Refer to CCS program ⑫
C: Students in comprehensive		

Profile of Regular Vocational Students

Subject	Profile	Treatment
ULTURAL FACTORS IMPEDING EARNING		
General Cultural Belief and Values	Employer concerns over academic capabilities are generally restricted to sufficient ability for carrying out employee functions. ⑫	
	Good career planning enhances ability to obtain the type of work wanted. ⑧	
	Are seen as those who will become and who exemplify the characteristics of the working population. ⑫	
	The single most important characteristic among workers (as far as employers are concerned) is not competency but dependability-following orders, being on time, etc. ⑫	Program for this dependability factor in pre-employment modules.
Prevalent reinforcement Patterns	-Grades do not appear to be strong reinforcers -Seem to obtain fewer honors and awards than the academic students. ④	Praise, threat removal and self satisfaction appear to be prevalent reinforcers.
Punishment Patterns	Major punishments are referral to authorities, suspensions and parental contacts. Parental contacts are most frequent. ④	
CIAL POSITION AS IT RELATES LEARNING		
Expectations of Being a Competent Learner	Expects to be less competent in learning academic subjects and act in such a way as to achieve this end. ⑮	Academic teachers should make use of vocational materials or problems in teaching their subjects.

Subject	Profile	Treatment
SOCIAL POSITION AS IT RELATES TO LEARNING		
Learning Environments	Individualized instruction is the primary approach reported by vocational education teachers	Type of Climate 1. Cooperative Should prove to be an effective learning environment since it provides for both peer reinforcement and peer sanctions. Cautions would include grouping Vocational Education with academic students. Conceivably, this might produce antagonism in academic courses. It could be effective however, if the abilities and functions of each student were taken into account. 2. Competitive Such approaches would appear to be best confined to the areas in which Vocational Education students feel competent - i.e. vocational courses. Primary reinforcement comes from "winning" or attempting to prove superior competence. Unfortunately, "losing" can prove to be punishing, as can peer comments made to the loser. It should prove helpful to continue the "contest" over several different areas (and/or time) as well as to work out a procedure insuring lack of humiliation to the loser. 3. Individualized Is the primary approach reported by Vocational Ed. teachers in teaching their coures.

Subject	Profile	Treatment
SOCIAL POSITION AS IT RELATES TO LEARNING		
Learning Environments - Continued		Primary reinforcement is provided by mastery of the material = success. Individualized programs typically assess the entry skills of students and pace instruction so as to prevent failure (i.e. punishment).
Groupings		If Vocational Education students are to be grouped with academic students, their abilities and functions should be taken into account. In academic courses, small groups would seem to improve group cohesiveness and assist Vocational Education students in keeping track of all group learnings or functions.
Instructor Variables		If tutoring were being performed by a peer, care should be taken that the Vocational Education student does not view that peer as condescending to one less able. Amount, length, and type of instruction will depend more on individual student characteristics than his or her membership in the Vocational Education group. Materials necessitating reading should be at a level that the student is capable of comprehending.

BIBLIOGRAPHY

1) Betz, R.L., Engle, K.B., and Mallinson, G.G., Perceptions of non-college-bound, vocationally oriented high school graduates. Personnel and Guidance Journal, June 1969, 47, p. 988-994.

2) Becker, W.C., Engelmann, S., and Thomas, D.R., Teaching: A Course in Applied Psychology, Chicago, Illinois; Science Research Associates, Incorporated, 1971, p. 499.

3) Crosby, R., The relationship of mental maturity to vocational maturity for a group of trade and industrial juniors., Journal of Industrial Teacher Education, Fall 1975, 13, p. 40-46.

4) Eninger, M.U., The Process and Product of T&I High School Level Vocational Education in the United States, The Process Variables Pittsburgh, Pennsylvania; Educational Systems Research Institute, April 1968.

5) Fishman, J., Mathematics in secondary school vocational education programs., The Mathematics Teacher, March 1971, 64, p. 261-268.

6) Flanagan, J.C., Davis, F.B., Dailey, J.T., Shaycroft, M.F., Orr, D.B., Goldberg, I., and Neyman, C.A., The American High School Student Pittsburgh, Pennsylvania; Project TALENT Office, University of Pittsburgh, 1964.

7) Flanagan, J.C. and Cooley, W.W., Project TALENT Report of the Eleventh Grade Follow-up Study, Pittsburgh, Pennsylvania; School of Education, University of Pittsburgh, April 1965.

8) Kaufman, J.J. and Lewis, M.V., The Potential of Vocational Education: Observations and Conclusions, University Park, Pennsylvania; Pennsylvania State University, Institute for Research on Human Resources May 1968, p. 160.

9) Lee, A.M. Sartin, R., and Fitzgerald, D., Learning a Living Across the Nation, Flagstaff, Arizonia; Northern Arizonia University, November 1974.

10) Nielsen, D.M., and Hielm, H.F., Reading and Career Education, Newark, Delaware; (ED) International Reading Association, Incorporated, 1975 p. 115.

11) Nieratka, E., Reading and the vocational student, *Industrial Education* October 1975, *64* p. 26.

12) Schaefer, C.J. and Kaufman, J.J., *Vocational Education: Social and Behavioral Perspectives*., Lexington, Massachusetts; (ED) Heath Lexington Books, D.C. Heath and Company, 1971 p. 208.

13) Stewart, B.R., Lash, N.S., and Kazanas, H.C., Influence of reading ability and verbal modality on principle learning of vocational students, *Journal of Industrial Teacher Education*, Fall 1975, *13* p. 49-55.

14) Wallace, H.R., *Review and Synthesis of Research on Cooperative Vocational Education*, Columbus, Ohio: ERIC Clearinghouse on Vocational and Technical Education, Center for Vocational and Technical Education, Ohio State University, June 1970, p. 116.

15) Wamhoff, C.H., *Self-Concept of Vocational Ability and Its Relation to Selected Factors in Career Development*., Doctoral Study, Michigan State University, 1969.

Profile of Low-Reading Students

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Listening Skills	Displays low listening skills -Frequent listening errors are: 1) short attention span 2) thinking about how to respond 3) neglecting to ask questions when clarification is needed. ⑥ Listening rates of 228-328 wpm. was more efficient for both learning and retention than the normal rate of 175 wpm. Significant reading failure was associated with four areas of auditory functions, reception, association, closure, and sound blending. ㊷	To increase attentive listening be aware of: 1) motivation level and attitude of students 2) amount of teacher talk and rate 3) amound of noise and other distractions 4) understanding level of speakers message ⑥ 5) organization of material is presented 6) amount of time student is expected to spend listening. Need to provide cues in obtaining optimal listening level. Factors affecting learning achievement are: 1) acuity ability to respond to various frequencies and at various intensities 2) fised functioning of both ears 3) input of sounds 4) auditory fatigue 5) effects of sustained exposure to sound of the same frequency Program to remediate sound blending problems. See Reading Treatment,
Speaking (p) Items specifically for primary reading disability students.	20-35% of disabled readers have speech disorders. Most frequent symptoms are faulty articulation, indistinctness (characterized by blurred consonant sounds and "thick quality") ① ② cluttering (rapid, jerky, stumbling speech). ④ ⑤ -90% of disabled readers stutter. ① -Speech problems occur more frequently among males than females. ③	In developing technical vocabulary, emphasize correspondence and accuracy of sounds produced by student. Have student pronounce the word if possible. Program special training in auditory discrimination. Insist that an object be called by its technical name rather than pointing or "that thing" etc. Behaviors found in reading and listening are: discrimination of words; vocabulary and concepts; concentration of task at hand; experience with language purposes; anticipation of meaning; mental reorganization of ideas noting details; following directions; detection of clues that show the speaker's or reader's trend of thought; inferences made; thinking with words; and enjoyment experienced.

Profile of Low Reading Students

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Reading	High incidence of impaired auditory memory span and/or ability to sequence. ⑨ (55) (p) Displays high frequency of static and kinetic reversals and letter-order errors. ㉓ Good attention to details (measured by the Minnesota Percepto-Diagnostic Test) at the visual level in grouping of similar elements. ⑲ Has difficulty discriminating between letters with similar forms. (55) Has difficulty in reading longer words and perceiving spatial relationships. (55) (p) Displays a high frequence of forgetting previously learned words. (55)	Program reading instruction to fit technical vocabulary and not to non-word perceptual training. Program for secondary reading disability with a linguistically-oriented instruction basis, for primary reading disability with an experience type of instruction. ⑭ Use of student oral language patterns in written material can contribute to increased reading comprehension. Use short and personalized statements. Use student's own unique vocabulary and style. There was an increase in reading level when students acted as tutors to younger boys. ⑮ Will need to program for discrimination, both auditory and visual. Token reinforcement program seems to maintain attention to reading task especially if can exchange for concrete reqards and privileges. 21 Might want to build within pre-existing program a reinforcement program. Questions placed after the prose passages facilitated retention more than questions placed before the passages. Assign tasks in content area orally and read printed explanation of the task(s) to them. Might want to use crosword puzzles as a visual sequencing exercise. (55)

(p) Items specifically for primary reading disability students.

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Reading	Has difficulty learning symbols. (55)	Might use tachistoscopt to heighten concentration, but be certain that they under-
	(p) Shows a lack of integration and interfacilitation among subskills, such as phonics and blending.	
	(p) Has an inadequate inner language and grammatical structure which tends to interfere with the formation of anticipatory response in reading. ㉖	
	(p) Students with visual perception problems tend to reverse, rotate, invert letters or transpose letters with words. Seem to have high incidence of visual memory problems which prevents them from remembering whole words. ㉙	(p) Convert the visual to the auditory as simply as possible. ㉙ (p) Forms of letters houldd be kept constant. It is relatively difficult for the poor reader to read both upper and lower case print. Use one form in your typing.
	(p) Students with auditory perception problems show disturbances in auditory perception, rhyming, blending analysis and memory. They fail to perveive sounds within words. Have difficulty with oral reading. ㉙	(p) Teach the student to read whole words. They have a difficult time learning phonics. The sight vocabulary nouns and verbs should be words which can be associated with an object, ecperience or picture. Match phrases and sentences with pictures. ㉙ (p) Amplify sound. ㉙ (p) Auditory training might include whispering exercises which necessitates careful attention in the blending of sound elements. ㉙
		Transfer from an auditory sequential pattern to a visual spatial one requires both an auditory-visual transformation and a sequential-spatial one.

(p) Items specifically for primary reading disability students

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Reading	(p) Can deal with specific and concrete stimuli but seems to have difficulty making generalizations. ⑩ Behaviors that are frequently displayed: Inadequate impulse control, highly narcisstic, disinhibited, hyperdistractible, hyperactive, dissociation, disturbance of figure ground, perseveration and poor self concept and body image. ⑩ ㉓	(p) Train directly on the perceptual deficit skill within the academic or skill area. ㉙
	(p) Problems in reading occur more frequently among males than females: ratio is 6-1. ⑩	
	(p) Overloading occurs frequently when information is received through several sensory modalities.	(p) Information must be given concept by concept and through one modality. Program should prevent overloading and might want to consider programmed-self-paced-immediate feedback instruction.
speed	(p) Frequently variable in their performance, display difficulties with abstract-concepts, and have poor short and long term memory. ㉔ There is a tendency to be a word by word reader, and with a tendency to lose the train of thought before a sentence or paragraph is finished. ⑧	Improve sight vocabulary and word attack skills, and phrase reading. ⑧ Rate can be increased through improvement of perceptual span. ② Technical words which are essential to the subject should be identified and concepts clarified prior to reading them. ㊺ To teach following directions, have student write directions; read the written directions to see if they are correct; and then analyze what if anything is wrong. Have students follow directions and then analyze errors. ①

(p) Items specifically for primary reading disability students.

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Reading		Approaches to motivation: 1) explain difficulties to student 2) use high impact remedial materials 3) the individual and small group settings for instructors 4) behavior modification (use of rewards) 5) stress reading enjoyment, physical touching, language experiences, and aural experiences. Might want to tape materials which students follow in book as they listen. (52)
Blending Sounds	High frequency of error in recognition of similarities and differences in beginning, middle, and ending sounds. ⑧	Practice in auditory perceptions; proceed from whole words to its parts; keep instruction(s) brief. ⑧
Reversals		Direct attention to specific points of difficulty rather than general area of reversals ⑧ Might want to color code the area of difficulty.
Comprehension		May be necessary to start instruction with identification of a complete sentence vs phrase. To understand sentences practice in answering who, what, where, when, why, and how. To understand paragraphs teach concept of main idea, use of pronouns, and words that show relationships and those that are signal words. To understand whole selection teach concepts of authors purpose, organizational plan, subordinate ideas that support the main idea. ⑧

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Comprehension		Teach new words in context. ⑩ Teach the sequence signal words - first, second, third, then, after, furthermore that are unique to to each technical area. Vocabulary highly related to comprehension. Total vocabulary of average 6th grader is 50,000 words. Average 12th grader 80,000 words. ⑩ Average rate of comprehension in words per minute: 6th grade - 235 Junior High - 255 Senior High - 296 College - 340 (for average student) ⑩
Writing		Syntactical patterns of language conceptualized by age 4 and dependent upon cultural orientation. ⑩ Provide good models of oral and written communication. ⑧ Studying grammar has no salutary effect on speaking and writing ability. ⑧

(p) items specifically for primary reading disability students.

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Thought Processing	No difference ascertained as analytic conceptualizers when dealing with processing of stimuli that do not involve reading. ⑲	(p) If the student has serious and identified neurological involvements; might have difficulty with program written for the non-reader; might program to use EMI materials. ㉕
	(p) High frequency of disorganized thinking; difficulty with abstract concepts. ㉔	(p) Determine which learning "circuits" are operative or inoperative and select materials which correspond with learning patterns. See physical status also. ㉙
Mathematics	Math computation skill more developed in relationship to problem solving. ④ Significant improvement in math computation in students who received remedial math and reading instruction. ⑳	Program might include emphasis of getting meaning from words and translating it into mathematical symbols. ⑫ Might want to conjointly work on math and reading skills. ⑳

(p) Items specifically for primary reading disability students.

Profile of Non-Reading Students

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
General Assessment		
Intelligence	On the WISC, displays lower scores on vocabulary, arithmetic, digit span, information, similarities, and ⑱ coding. (20A) Frequently scores higher on performance than on verbal tasks; with most difficulty on tasks that deal with auditory-oral processes. ⑲	Most of the students fall by definition in the average IQ range: 90-110.
Achievement		Reading expectancy formula (Bond and Tinker) IQ x years in school + 1.0.
Physical Status		
Visual	-(p) Difficulty with left-right visual scanning. ㉖	Present material in center of screen. ㊹
	High frequency of incomplete or confused dominance and eye-coordination problems. ⑧	-One-third of the population is mixed dominance and there is much disagreement on its effects on reading disability.
	High frequency of left-handedness. ㉖	

(p) items specifically for primary reading disability students.

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Perceptual Status		
Form Discrimination	-Correlation between perception and reading skills decreases steadily with age and grade level. ㉛	It is important not to program for isolated perception variables but to inhance the cues necessary for success.
	-Able to accomplish unilateral discrimination (stimuli presented to one dimension at a time). ⑲	Tendency to become "perceptually" normal when problem is remediated.
	-Use difficulty accomplishing bilateral discrimination (asks where the student must discriminate on more than one dimension). ⑲	In classification and discrimination tasks, be sure that items are either discrete and/or the dimensions to be noted are clearly specified. ⑲
Attention	(p) Exhibit short attention span for mental work; easily distracted and fatigued quickly. ⑱	Increase motivation to want to read and to indicate a need to read; might use cartoon to gain attention. The neurological impress method might be considered.
Retention	(p) Long-term recall impaired; seems to be related to slow speech-motor encoding, presumably because slow encoding preempts time that would otherwise be available for rehearsal. ㉖	
	-Seems to have most difficulty with memory for position of task. ⑩	Note: Memory of position was the best discrimination indicator between readers and non-readers. 10 During acquisition, lesson should focus on one or two specific skills. Might want to program so that a certain skill can be overlearned. Completely different activities (new skills are less likely to interfere with memory storage than similar and competing activities.) ⑩

(p) Items specifically for primary reading disability students.

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Retention - Continued		Cueing, prompting and immediate feedback did not improve learning on certain types of tasks (See Anderson's article)
	Emotionally charged distractors (teacher disapproval, disturbance in the room etc.) interfere with gathering and processing of information. ⑩	
Transfer of Training		Must recognize likenesses as well as differences Clarify the objectives of instruction, provide numerous similar situations which call for the response taught. Transfer to new tasks will be better if, in learning, the learner can discover relationships for himself, and apply principles within a variety of tasks. Spaced or distributed recalls are advantageous in material that is to be retained. ② Present broad general experiences under various conditions. Discovery learning insures positive transfer of broad principles strategies and the use of the objects involved from one area to another. Use verbal instructions and hints. ㉘

(p) items specifically for primary reading disability students.

Subject	Profile	Treatment
KNOWLEDGE LEVEL Transfer of Training - Continued		Specific skills and knowledge transfer readily from one situation into another of the same type. Where no identical bonds existed between two processes, little transfer would take place; where there were identical processes, transfer would be positive; and when the learning of the new process necessitated the breaking of a previous bond, the transfer would be negative and interference would occur. Meaning facilitates transfer and increases as the connections between the stimulus and response increase in number. ②
Channels of Receiving Information Visual Presentation	Gains in word meaning and comprehension noted with a film-presented program. ⑰	
	Pictures when used as adjuncts to the printed text do not facilitate comprehension (56) but influence attitudes.	
	Speed and efficiency of reading increased significantly with an increase in candle power; up to 25+. The critical level of illumination is between 10+-25. ㉛	
	Optimal rate of reading occurred with line widths 14-30 picas and with 1-4 points leading. ㉛	Note: Program for these variables - candle power and size of print. Be sure that background of printed material(s) is not distracting.
(p) items specifically for primary reading disability students		

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Effects of Presentation		Focus attention on desired objectives. ⑧
Effectiveness Level	Familiar material is retained more from an auditory presentation; unfamiliar material is retained more from a visual presentation. Immediate comprehension of information favors a visual presentation; long term comprehension favors an auditory presentation. ① (See chart) Programs stored thru multisensory experiences are more likely to be recalled than those stored through a single sense. ⑧	Combination of visual and auditory presentation more efficient than auditory or visual alone. ① Power of retention: 1) 10% of what they read 2) 20% of what they heard 3) 30% of what they saw 4) 50% of what they saw and heard 5) 70% of what they said as they talked 6) 90% of what they say as they do a thing. ① Note: Program for optimal retention; what they say as they do a thing.

	Familiar	Unfamiliar
Auditory	+ long term	
Visual	associative tasks (word-pictures) immediate	+

(p) items specifically for primary reading disability students.

Profile of Low-Reading Students

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Effects of Presentation - Continued		
		Might want to use a variety of stop-start initiated programs; this needs to be used with caution because student may be unable to determine the appropriate rate. Might have to teach student the rate that is appropriate.
	Seems to learn noun associations more readily through auditory presentaiton. ⑯	
		Teach the SQ3R method - survey, question, read, recite, review - and provide for practice time.
	(p) Deficient on a variety of serial memory tasks using visual and auditory inputs. ㉖	
ATTITUDES TOWARD SELF AND OTHERS		
Self Evaluation		
General Appraisal	Perceived as impulsive and lacking in emotional stability, insecure and anxious, submissive, defiant, hostile, suspicious, negative self-concept, low tolerance for frustration. ㉕ Feels rejected, difficult to organize a situation, apprehensive, worrying, depressed, guilt-prone. ㊸ Displayed general lack of self-understanding. ㉕	Token reinforcement, counseling, adult approval and interest, immediate success increased motivation.

bject	Profile	Treatment
ATTITUDES TOWARD SELF AND OTHERS		
Perceived Level of Freedom	The student perceives that his ability to make decisions is limited. ㉗	Good reading abilities correlate positively with: 1) social independence 2) a positive self-concept 3) the desire and ability to make one's own decisions 4) to have freedom from anxiety about those decisions. ㉗ Might need to program to change attitude that can make decisions. The student will need to use different input as the basis for the decisions and not solely depend on reading for information.
Ability to Function Under Stress	As anxiety increases, phrase-reading performance decreases. ㉗ Highly anxious students perform better in a structured approach. ㉛	Through a process of generalization, interference to concentration is manifested whenever any stimuli remotely resembles reading. The greater the stimulus resembles reading, the greater the tension, the greater the stress. The stress evokes intense feeling of inadequacy which encroach upon concentration. Avoid high stress and disorganization. Use learning sets and advance organizers. ⑧ Provide incentives Set realistic goals; this is important for both the teacher and student.
Achievement Motivation	Displays less orientation to achievement and shows a greater need for being different. ㉕	To change attitudes the students will need to be constantly aware of their improvement (might want to chart or graph this improvement); student needs to learn by methods he enjoys; avoid unfavorable comparisons with other students; provide with as much success as possible; provide a friendly atmosphere in which students feel free to

Subject	Profile	Treatment
ATTITUDES TOWARD SELF AND OTHERS		
Achievement Motivation-Continued		express their opinions; be consistent in behavior toward students; attempt to provide each students relationship with his peers. ①
Perceptions of Others	If student is not doing well in school, will probably have a negative perception of teachers in general. ㊻ Girls generally perceive their teacher more favorably than boys. ㊻	
Others Perceptions	Teacher's perceptions of non-reading students: 1) demands much attention in class 2) displays stubborn uncooperative behavior and explosive behavior 3) uses abusive language 4) fights with other students 5) is generally unhappy ㉔ Teachers expectations were determined in part by past cummulative records. These expectations significantly affect the student's level of confidence. They noted scholastic potential tended to verify the teacher's initial expectations. ①	Perception of teacher's feelings correlated positively and significantly with student's self perception. ㊻
SOCIAL POSITION		
Behaviors That Interfere With Learning	Displays a high incidence of dependency, insecurity and inadequate social adjustment. ㉘ Generally scores low on the extroversion scale, or has a tendency to be introverted. ㉙ Frequently is seen as not accepted by peers because of not being able to conform to general school rules. ㉗	

Profile of Non-Reading Students

Subject	Profile	Treatment
CULTURAL FACTORS	(p) Reading problem frequently is evident in other family members. ④ Disabled readers frequently came from low SES homes. (29) Shows a lack of self understanding and some delay in identification with adults of the same sex; displays attitude of less orientation to achievement and a greater need for deference. (25)	Social class and achievement in school are significantly related. (46)

PRIMARY AND SECONDARY READING DISABILITIES

Harris, A. J. Diagnosis and Remedial Instruction in Reading in Robinson, H.M. (Ed.) Innovation and Change In Reading Instruction (The Sixty Seventh Yearbook of the National Society for the Study of Education, 1968), pp 159-194

Primary and Secondary reading retardation are terms proposed by Rabinovitch, R.D. "Dyslexia: Psychiatric Considerations" Money, J. (Ed.) Chapter V in Reading Disability: Progress and Research Needs in Dyslexia (Baltimore: Johns Hopkins Press, 1962), pp 73-79
Primary reading retardation is a term referring to a severe impairment of capacity to learn to read which, although there is no brain damage, is based on a constitutional pattern of disturbed neurological organization. In contrast, "secondary reading retardation" refers to a reading disability for which the causation is mainly environmental or external.

Primary Reading Disability

The defect is in the ability to deal with letters and words as symbols, with resultant diminished ability to integrate the meaningfulness of written material. A variety of learning disabilities is the most prominent manifestation of the condition during the school years.

- The integrative difficulties are not completely specific to reading; they can be found in related aspects of perception and cognition
- Shows deficient ability to deal with the Gestalt aspects of perception and cognition or in the ability to deal with relationships there is likely to be difficulty

1) in comparing parts within wholes in both visual and auditory perception

2) in clearly distinguishing figure from background

3) in achieving closure (filling in missing parts)

4) in grasping sequential arrangement

5) directional difficulty with reversals in reading and writing

6) in integrating (blending) parts into a recognizable whole

7) in establishing associations between sensory modalities - the sound of a word with its visual appearance or the "feel" of a cut-out or traced letter with its visual appearance

References - Non-Reading Students

1 Ekwall, Eldon E., Diagnosis and Remediation of the Disabled Reader Boston: Allyn and Bacon, 1976.

2 Smith, Henry P. and DeChant, Emerald V., Psychology in Teaching Reading Prentice-Hall, Inc., 1961.

3 Thompson, Lloyd J., Reading Disability, Developmental Dyslexia Charles C. Thomas, 1966.

4 Harris, Albert J., How To Increase Reading Ability, David McKay Co., Inc., 1970.

5 Vernon, M.D., Backwardness In Reading, Cambridge University Press, 1957.

6 Lawson, L. I., Language Disorders: The Relationship of Speech Defects and Reading Disabilities, Flower, R.M., Gofman, F.F., and Lawson, F.A., Reading Disorders, David Co., 1965.

7 Artley, A. S., Trends and Practices in Secondary School Reading, I.R.A. Research Fund, 1968.

8 Otto, W., McMenemy, R.A., and Smith, R.J., Corrective and Remedial Teaching Houghton Mifflin Co., 1973.

9 Smith, H.P., DeChant, E.V., Psychology in Teaching Reading, Prentice-Hall, Inc., 1961.

10 Robeck, M.C., and Wilson, J.A.R., Psychology of Reading: Foundations of Instruction, John Wiley and Sons, Inc., 1974.

12 Weintraub, et. al., Summary of Reading Research, Reading Research Quarterly, Winter 66-67, II/2, p. 73.

13 Heath, E.J. and June, S.D., "The Less-Than-Optimal Student": Profile of the L. D. Child, Academic Therapy, Summer, 1974, 9/6, p. 469-474.

14 Journal of Education Research, March, 1969, 62/7, p. 310.

15 Weintraub, et.al., Summary of Reading Research, Reading Research Quarterly, Spring 73, VIII/3, p. 374-5.

16 Weintraub, et.al., Summary of Reading Research, Reading Research Quarterly, Winter 68, III/2, p. 180.

17 Weintraub, et.al., Summary of Reading Research, Reading Research Quarterly, Winter 68, III/2, p. 238

18 Ackerman and Peters, Children With Specific Learning Disabilities: Wisc Profiles, Journal of Learning Disabilities, March 71, 4/3, p. 150-164.

19 Levine, M., and Fuller, G., Psychological, Neuropsychological, and Educational Correlates of Reading Deficit, Journal of Learning Disabilities, November, 1972, 5/10, p. 563-71.

20 Weintraub, et. al., Summary of Reading Research, Reading Research Quarterly, Winter 68, III/2, p. 197.

20A Hunter, E.S., and Johnson, T.C. - Developmental and Psychological Differences Between Readers and Nonreaders, Journal of Learning Disabilities, 4/al, December 1971, p. 572-77.

21 Weintraub, et. al., Summary of Reading Research, Reading Research Quarterly, Winter 71, VI/2, p. 207-8.

23 Reed, J.C., Rabe, E.F., and Mankinen, M., Teaching Reading to Brain Damaged Children: A Review in Educational Perspectives, Hammill, D. D., and Bartel, N.R., (ed.), Learning Disabilities, John Wiley and Sons, Inc., 1971, p. 94-114.

24 Abrams, J.C. and Smolen, W.O., On Stress, Failure and Reading Disability, Journal of Reading, March 1973, p. 452-66.

25 McDonald, A.S., What Current Resarech Says About Poor Readers in High School and Collete, in Hafner, T.C., Improving Reading In Secondary Schools, MacMillan Co., 1967, p. 249-259.

26 de Hirsch, N., Psychological Correlates of the Reading Process, in Hafner, T.C., Improving Reading In Secondary Schools, MacMillan Co., 1967, p. 259-70.

27 O'Donnell, R., Awareness of Grammatical Structure and Reading Comprehension, in Hafner, T.C., Improving Reading In Secondary Schools, MacMillan Co., 1967, p. 358-62.

28 Gleaned from Many Sources.

29 Spache, S.D., Educational Reading Disability and Perception, I.R.A., 1969.

30 Frostig, M., Visual Modality and Reading, in Smith, H.K., (Ed.), Perception and Reading, I.R.A., 1967, p. 25-33.

31 Abrams, Jules C., Neurological and Psychological Aspects of Reading, in Smith, H.K., (Ed.), Perception and Reading, I.R.A., 1967, p. 63-67.

42 Weintraub, et. al., Summary of Reading Research, Reading Research Quarterly, 73-74, IX/3, p. 389-90.

43 Lawrence, The Effects of Counseling on Retarded Readers, in Educaitional Research, February 1971, 13/2, p. 119-24.

Weintraub, et. al., Summary of Reading Research, Reading Research Quarterly, 1974-75, X/3, p. 355-56.

45 Strang, R., McCullough, C.M. and Traxler, A.E., The Improvement of Reading, McGraw-Hill Book Co., 1967.

46 Davidson, H. H. and Fang, Gehard, Children's Perceptions of Their Teacher's Feelings Toward Them Related To Self-Perception, School Achievement and Behavior, in Banks, J. A. and Joyce, W. W., (Ed.), *Teaching Social Studies to Culturally Different Children*, Addison-Wesley Publishing Co., 1971, p. 113-127.

51 Earle, R. A., Word Recognition: Secondary Level, in *Journal of Reading*, March, 1972, p. 459-63.

52 Noland, R. G., and Croft, T. H., Methods to Motivate the Reluctant Reader, *Journal of Reading*, February 1976, p. 387-91.

53 Palmer, W. S., Teaching Reading in Content Areas, *Journal of Reading*, October, 1975, p. 43-50.

54 Chester, R. D., The Psychology of Reading, *The Journal of Educational Research*, May-June, 1974, 67/9, p. 403-408.

55 Frostig, M., Disabilities and Remediation in *Reading Academic Therapy*, Summer, 1972, p. 373-91.

56 Samuels, J., Effects of Pictures on Learning to Read, Comprehension and Attitudes, *Review of Educational Research*, June, 40/3, p. 397-406.

57 Weintraub, et. al., Summary of Reading Research, *Reading Research Quarterly*, 1974-75, p. 334.

58 Gulterie, J. T., Models of Reading and Reading Disability in *Journal of Educational Psychology*, 1973, 65/1, p. 9-18.

59 Tave, P., Pollack, C., and Sher, N., Remotivation of Disruptive Adolescents, *Journal of Reading*, February, 1972, p. 351-54.

Profile of Visually Impaired

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Listening	-Comprehension is best at 175 wpm. ⑫ -Comprehension is not appreciably diminished at 225-275 wpm. ⑫	-Most recorded materials are at 175 wpm. ⑫ -Attention is increased at 225-275 wpm. -Have brailled or printed materials available (correlated with audio) for reference.
Speaking	-No difficulties in expressive language as compared to average; however, attainment initially is slower. ④ -Speech may sometimes be too loud and at a slow rate. ㉒ -(B)May show less vocal variety, lack of modulation and less lip movement. ㉒ -(B)May show few coordinated facial expressions or body movements.	-Verbally expressed concepts should be checked for accurate understanding by manipulation and/or thorough questioning i.e. often times student can give excellent verbal description of something but possess no real understanding of it. -Remind student to soften voice and tone. Rate of speech can be regulated with practice. -Teach the student appropriate facial expressions and when to use them, especially in social interactions.
Reading	-May have more difficulty in sequencing and deductive reasoning tasks because of slow reading rate. -Average reading rate is 120 wpm. using large type (18, 24, or 32 point type). ⑦ ㉛ -No significant difference in types of reading errors except for slightly more reversal errors. ④ -Accuracy in sight words (once learned) higher than average. ④ -(B) Braille reader's average speed is 90-110 wpm. ㉔ ⑫	Most available materials are printed in 18 point type. Reader should select smallest type he can read to promote speed and availability of materials. ④ The student will need instruction on spatial orientation and organization to counteract reversals. Teach to sight words utilizing kinesthetic and tactile senses. Will need repeated presentations to initially learn new words. (B) Oral presentations and "question and answer" periods are the best ways to aid complete understanding.

B-Specifically for Blind Students

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Writing	-No differences in grammatical abilities. ④ -Handwriting is poor, often because of visual-motor integration problems. -May display more difficulty with visual memory tasks.	Train visual-motor memory; use paper with more widely spaced lines; manuscript is often neater although slower; train to space words. Reinforce with aural material.
Thought-Processing	(B) May have a smaller body of general knowledge facts to use in deductive and inductive thinking.	(B) Teach concepts in well-planned units, where each part is connected to the whole. Example: Do not just show a screwdriver, tell the student what it is to be used for, let the student use it, ask student what the screwdriver is made of, show the student many sizes and types, help the student to classify the screwdriver (tool), identify all the salient parts. In instruction, teach from general to specific concepts.
	(B) Concepts about objects presented in isolation may be difficult to remember. New knowledge must be built into his organization by others. ⑰	(B) When describing objects, use tactual terminology i.e.: smooth, hard, cold; not visual terminology i.e.: shiny, light. ⑰
	(B) The word "see" to a blind person means to handle, hear, or understand by other means.	Instruct in very concrete terms, using as many actual objects as possible - do not assume any incidental learning. Example: The student may not know how to use the correct tool. ⑬
Mathematics	Computation level is 16-20 % below standards for sighted. ⑧ ㉙ ㉕	Difficulty is probably not due to lack of ability to comprehend, but maybe due to materials on which to do computation. ⑧ ㉙ ㉕
	May have difficulty in estimating answers. ㉕	(B) Use abacus for computation; for increased speed and accuracy. ㉙ Provide increased practice exercises on estimation. Give kinesthetic cues. ⑩ Determine estimation.

B-Specifically for Blind Students

Profile of Visually Impaired

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
General Assessment Intelligence	Average abilities-Binet (B) Tested lower than sighted on all Binet items classified under "thinking" or reasoning. ㊲ WISC-Average range; high on similarities and vocabulary, poor on information and comprehension. ④ (B) High incidence of either retarded or gifted functioning levels. ⑱	For instructional materials, be sure to program for reading and math achievement levels and not to abilities levels. (B) Might program for borderline mental ability or might use informal assessment procedures to assist in deciding where to program.
Achievement		Extension of time limits on testing added 3 months to scores of partially sighted children taking standard tests in all subject areas.
Reading	Reading achievement is 1-2 grade levels below standards. ④ ⑳ Biggest discrepancy between ability and achievement is shown in oral reading. ④	(B) Slowness of reading braille accounts for some of the underachievement. ④ Concentrate on audio presentations with silent reading of material at the required minimum. Significant gain in using large print materials for students with a severe impairment, at least 20/200.
Math	Math achievement is .86 - 1 grade below standards. ④	Large print materials do not produce significant achievement gain. ⑦

Highest Skill			Lowest Skill
Math Computation	Reading	Spelling	Science

B-Specifically for Blind Students

Subject	Profile	Treatment
KNOWLEDGE LEVEL Attention	May be highly distractible by auditory stimuli.	Verbal clues are needed to gain attention. Call student by name; even if the student is the only one in room; establish eye contact. Help students to identify the sound(s) and the source and then continue instruction of the lesson.
Retention	Visual presentation enhances immediate recall Auditory presentation enhances delayed recall ⑮	Discussion promotes retention. Actual presentation may not have accurately correlated the new information to something already known. Discussion will do this and will pick up and correct any mislearning. Concepts presented in isolation will not be remembered. ⑰ Always connect new information (object or fact) to something already understood. "This is a carbuerator. It is a part of the engine here."
Transfer of Training	(B) Transfer of a verbally-learned concept (a square has 4 equal sides) to a tactual presentation (which is a square?) is difficult. ①	(B) Practice and try to present as much tactual material as possible with verbal discussions.

Profile of Visually Impaired

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Practice (Amount as it relates to retention)	May require much more practice at manipulation of tools and parts. Amount of time may vary due to experience of individual, but at least 3 times as many practices are seen as minimum.	Time sessions to alternate manipulation with listening and written work. Let them have time to try projects along but observed and then alone unobserved. Talk student through steps the first time. Repeated - continuous listening of literary style (do not change style and format frequently).
	Frustration limit maybe shorter than average.	Stop sessions before frustration sets in, will give up or need much encouragement to continue.
Physical Status	No difference in height, weight, or strength.	Might need physical strengthening because of disuse.
Hearing	No difference in acuity, may show a heightened ability for discrimination. ㉒	Sounds must be attached however to meaningful and understood sources.
Vision	Will probably tire more easily.	Program periods to alternate eye use with eye rest. Prevent excessive fatigue. ⑮
	25% of students extremely sensitive to light. Glare may bother all	Provide oblique source of light. Dull finishes on work surfaces to prevent glare. ⑮
Perceptual Status	Will probably have difficulty with figure-ground presentations. ㉔	Object of discussion (figure) must be on a clear, unconfusing background. ㉔
	(B)-Laterality may not be well established; left-right discrimination difficulty. ㉒	(B) Training of body position in space.
	(B) Uses vision as main perception. ㉟	May often need training in visual discrimination. Should encourage the student to work on materials which might be difficult to see. ②

B-Specifically for Blind Students

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Perceptual Status - Cont.	(B) Tactual judgements of comparison and discrimination may not be consistent. May rely on residual vision to classify information. ㉟ Able to judge distance and space through hearing with practice and cues. ⑮	(B) Smaller or actual size forms are easier to discriminate, make comparisons for student, i.e. "this nail is much longer than this one". ⑥ Program student to use vision more effectively by visual discrimination training. Process that might be followed: 1) Use smaller, or actual size forms; ideal size is about 1" long, preserve the integrity of the object. 2) Use criteria of a. texture b. size c. relationship between objects d. temperature changes e. object identification f. basic skills 3) Categories of visual training: a. form b. light - dark c. position d. inner-detail e. size f. size and position g. detail h. position in space i. pattern detail j. object unification k. visual closure l. spatial perspective m. figure detail n. object Teach concepts of form and shape before use in the actual situation, so that all terminology can be understood. Complex tactual material may look clear to the sighted, but confusing to visually impaired.

B-Specifically for Blind Students

Subject	Profile	Treatment
KNOWLEDGE LEVEL Channels of Receiving	Seems to learn best through the combination of all channels, visual, auditory and motor.	Presentations must be clear and simple. The student will then be able to scan the information and pick out the pertinent points much quicker. ㉗
Information Visual Presentation	(B) Must use other modalities. Oral presentations must be clear with actual materials used.	Eliminate all objects of facts in the presentation that are not pertinent. Pictorial representations should be free of extraneous stimuli; background should be clear. Outline significant features of a graph, map, or diagrams with heavy black lines (use black marking pen) ⑮ Enlarge most maps and graphs. Eliminate any nonessential details. ⑮ Color code most significant points or features to be referred to in discussion. Lettering must be clear and well spaced. Use double space between lines and words. Each student will have different conditions under which he sees best. ④ Provide student with the opportunity to find conditions that are most comfortable -eliminate glare by using dull finished paper and desks. Artificial lighting produces less glare than direct sunlight. Do not use flickering lights. ㉔ -provide extra lighting equipment high intensity lamps, multi-switch lighting for room -make some provisions for darkening part of the room with low intensity lighting.

B - Specifically for Blind Students

Profiles of Visually Impaired

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Channels of Receiving Information		
Visual Presentation-Cont.	Students with visual acuity of 20/200 or less show significant gains in comprehension with enlarged illustrations. ㉗	A traced picture (lined drawing with areas blacked in for contrast) is more legible than a black and white photo offset. Enlarge picture to no larger than 8" by 11". Keep it simple and clear. ㉛ Materials should not be produced in low-color contrasting combinations or on sheen paper. ㉘ Use dark color on pale color or pale on dark. Black on white or white on black is best, but use colors for interest. ㉘
	Reading distance is 6.5 inches as compared to 14 inches, also writing or drawing distance. (Related more to the pathology of the eye.)	Have desks with top adjustable for height and angles or work-need to bring work close to eyes without creating poor posture. ㉒ Will need preferential seating only if the student can see the chalkboard from the front row. ⑮ (B) Work areas will need to be small and easily memorized. Have storage area immediately assessible to student.
Haptic Presentations Blind	(B) May learn best by manipulation of objects and the environment directly and actively.	Objects they can hold in their hands are easiest to comprehend. ⑮ Give in addition, audit, olfactory, and gustatory experiences whenever possible. Ask frequent questions, so that the important points are not missed.

B-Specifically for Blind Students

Subject	Profile	Treatment
KNOWLEDGE LEVEL Haptic Presentations Blind - Continued	Application of visual models for perception in learning often has negative results, especially for the young or retarded blind. Ability to recognize tactually embossed designs or pictures, especially 3 dimensional objects is very limited. ㉕	Change visual stimuli (drawings) into tactual objects where possible. Move person to objects that cannot come to him. ④ When describing or comparing object, use terminology of sound or touch. Example: "A screwdriver is long and slender with a rounded handle at one end. The handle is either wood or plastic. The rest of the tool is called the shaft. It is metal. The narrowed end is the part you use to drive in the screw. I'll show you how to use it. Screwdrivers come in many different sizes. I'll show you some." Give ample opportunity to explore and manipulate each object. ⑰
	Objects presented in isolation will not have any meaning. ⑰	Have the whole project on the work space while discussing each part, so the student can understand how parts are related to each other and the whole. Example: Before the above discussion would take place, tell the student that you are going to show him how to attach this plant hanger to this piece of wood representing a wall.
	May have difficulty with incidental learning.	Try to give the student the experience the sighted student would learn incidentally by observing. Do before any major oral presentation so the student will understand what you will be discussing. ⑮ Time limits will need to be self paced. This self-pacing might need to be instructed and continuously monitored.

B-Specifically for Blind Students

Profile of Visually Impaired

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Auditory Presentation	Meaningful, familiar material can best be presented aurally. ⑮	Auditory presentations are best for review, relearning and non-factual literary material.
Effects of Presentations Styles	(B)The larger the room or the work area, more incidence of failure to memorize the area may be evident. ⑤	(B) Provide with a reference point, either tactual or auditory, in tasks that require movement or source location. ㉟ Example: (1) Set work area up like a clock fact-objects at top are at 12:00, objects at bottom are at 6:00, then you can locate by "hour point" for reference any object on the work space. (2) The door is by the clock (ticking). In all jobs, keep actual work area small-everything should be within arms reach. ⑤
	Will need more time to complete tasks; Can demonstrate achievement more adequately under reduced time pressure. ㉔ ⑦	Will differ for each child; approximately 1.5 times longer.

B-Specifically for Blind Students

Profile of Visually Impaired

Subject	Profile	Treatment
ATTITUDES TOWARD SELF & OTHERS		
Self Evaluation	(B) May often adopt negative attitudes of the seeing. May feel that valued traits such as self-sufficiency, economic independence, environmental mastery or physical desirability are not within reach. ④ ㊱ May generally be less able to accept visual impairment. ④ Self-image or perception will probably be related to the student's functioning level. ②	(B) Be sure to program for success as much as possible. Do not over-praise successes; expect as much from the blind as from the sighted. Do not be oversolicitous and give unnecessary help. ⑮ In modules build into the format the attitude that "you can do the work in spite of difficulties". Teach the student to evaluate the responses. This will increase the positive attitude of being in control of his behavior and resources.
Ability to Function Under Stress	Behavioral reaction to stress; shortening of steps, stiffening of limbs, dropping of head. ㉞ (B) Will probably be under stress constantly when dealing with unfamiliar environment(s).	A sighted guide (for the blind), or a partner (for partially sighted) will relieve some of the anxiety. ⑮ Reduce time pressure. Break serious sessions with humor.
Achievement Motivation	Blame is not an effective motivator, nor is overly praised success. ㉑ (B) Must actively handle and move around in the environment, yet will need encouragement to do this. ⑭	Treat success and failures as you do with the sighted. Do not let the student lay blame on you for the failure. (Unless you have goofed.)

B-Specifically for Blind Students

Profile of Visually Impaired

Subject	Profile	Treatment
ATTITUDES TOWARD SELF & OTHERS		
Perceived Level of Freedom of Movement	May be reluctant to voice concerns for better viewing placement.	Encourage the student to voice concerns. (B) For movement within environment: Sighted guide is most efficient at first. After environment is learned, the student can function independently.
Failure Set Pattern	When failure occurs, may frequently blame teachers for not helping enough - "The teacher is a very nice person, but the teacher just doesn't know how to teach me".	Often times will be very dependent and have gaps in the content area. Make sure the student understands prerequisite terms, facts and skills before starting a new lesson.
Perception of Others	(B) The initial and probably the general impression is usually unfavorable because of inappropriate social habits, poor physical appearance, and lack of competitive aggressive attitude toward work. May have mannerisms which many unstimulated people display: poking fingers into eyes, shaking of hands, and rocking. Often talks too much and at inappropriate times. ㉔	
	Partially sighted students with moderate impairment (20/70 to 20/200) are the least well accepted by others. In the classroom, these students seem to have little trouble, but they cannot do many of the average requirements. The paradox is hard for the sighted to understand. ④	Explanations to sighted students must be provided that there are many adaptions for academic learning which enable the visually impaired to compete equally with them. There are few aids however, to help them keep up in social games or activities.

B-Specifically for Blind Students

Profile of Visually Impaired

Subject	Profile	Treatment
CULTURAL FACTORS IMPEDING LEARNING		
General Cultural Beliefs & Values	(B) The general population underestimates or devalues the abilities of blind people. ③	Estimate of worth increases as contact increases in school-age children; adults or people with their mind set consider success of a blind person a fluke or miracle.
	(B) Frequently is seen as a deviant.	
	(B) Motivation to work is diminished because the culture provides and subsidizes a blind person.	Might diminish the student's need and motivation to work.
	Beliefs that cause employers not to hire the visually impaired are:	They are more careful and less prone to accidents.
	they are afraid that hiring the handicapped will increase insurance rates. they feel that the visually impaired will lower production rates. they feel that the visually impaired worker will not remain in the position (will increase turnovers). ⑯	-if well trained they are very efficient. -once employed they are very stable employees.
Prevalent Reinforcement	(B) Is as independent as the perception of family members and sighted friends allow. ⑲	
	(B) Role of "the poor blind person" reinforced by pity, humanity and unnecessary help.	(B) Help classmates to see blind person as an equal and not to let them be oversolicitous. Treat student as equal also, so that resentment of special treatment is not created. Whole class demonstrations or lectures by the blind person perpetuates images of "miracle" or being a deviant. Encourage the class to observe facts on their own or interest an individual to take an active interest in the skills of the blind student.

B-Specifically for Blind Students

Subject	Profile	Treatment
CULTURAL FACTORS IMPEDING LEARNING		
Prevalent Punishment		(B)May feel more need to get along with other people. Peer pressure is very effective. (B) Peer pressure is effective in producing appropriate behavior.
SOCIAL POSITION AS IT RELATES TO LEARNING		
Stereotyped Roles	Misconceptions: (B) Has mystical "Sixth Sense" or Facial Vision. ⑮ (B) Portrayed as kind, patient, and unable to earn a living.	"Facial Vision" does not exist and the ability to judge how close to a wall you are is a function of hearing and can be taught to anyone. Blind people have tempers, often worse than normal because of the prevalence on brain-damage among the blind (50%).
Social Class Cues	(B) Has frequent difficulty establishing eye-contact; this usually supplies clues of the person's communication intention. ⑩ (B) Has difficulty seeing body language that supplies clues as to the "uncomfortableness" of others. Frequently misinterprets the verbal intonations.	Be sure to program for appearance of eye contact. Train by: 1) look at person who is speaking 2) judge if person is sitting or standing and approximately where eyes would be given that position. Train the person to realize social cues: when person is uncomfortable and wants to leave, the person will give little verbal feedback, will move farther and farther away, or will begin to squirm. Also, make sure the student realizes that it could be for a variety of reasons, that the person wants to go, (might do perception checking).

B-Specifically for Blind Students

Profile of Visually Impaired

Subject	Profile	Treatment
SOCIAL POSITION AS IT RELATES TO LEARNING		
Social Class Cues-Cont.	People become anxious, irritated, or annoyed, because the partially sighted student appears awkward during the period of adjustment to a new environment.	Use one person as a guide to alleviate awkwardness in adjustment to a new situation.
Expectations of Being A Competent Learner		Should expect the student to care for own materials and personal items. ⑮ Need adequate work space (books generally are twice as large as regular), more storage space, adapting equipment (low vision aids), and adjustable top desks, but space must be easily memorized. Teach the student the locating technique if not already known.
Learning Environment	Seems to work and learn best in structured and individualized climates. -Gains significantly in programmed learning. ㉝	As blind are deprived of visual observation, they need 1 person to interpret the environment for them. It takes a long time to establish this relationship. An older person is best, rather than peer. Need one person whom they can trust and model after. ⑮ Need to experience and learn from many instructors. ⑪ Team or group efforts help develop a cooperative relationship with co-workers. ⑪

TERMINOLOGY FOR THE VISUALLY IMPAIRED

Nystagmus -- condition found in many visually impaired people; the eyes are constantly moving, unable to focus on any one thing for more than a very short time. These people are often the poorest readers.

Myopia - near-sightedness

Hyperopia - far-sightedness

Binocular vision - ability to use both eyes at the same time

Fusion - ability to focus both eyes at the same time on the same thing

Monocular vision - can focus only one eye at a time. Usually will have poor, if any, depth perception.

Aphasia - lens in eye has been removed, due to cataract.

REFERENCES

1 Axelrod, S, Effects of Early Blindness: Performance of the Blind and Sighted Children on tactile and Auditory Tasks, New York: American Foundation for the Blind, 1959

2 Barraga, N. C., "Utilization of low vision in Adults Who Are Severely Visually Handicapped", New Outlook for the Blind, May, 1976, Vol. 70

3 Bateman, Barb, "Sighted Children's Perceptions of Blind Children's Abilities", Exceptional Children, 1962, Vol. 29

4 --, "Visually Handicapped Children", in Methods in Special Education, New York: McGraw-Hill Book Company, 1967

5 Bauman, Mary, "Guided Vocational Choice", New Outlook for the Blind, October 1975, Vol. 69, No. 8

6 Berla, Ed "Effects of Physical Size and Complexity on Tactual Discrimination of Blind Children", Exceptional Children, October 1972, Vol. 39

7 Birch, Jack, "School Achievement and Effect of Type Size on Reading in Visually Handicapped Children, Co-operative Research Project No. 1766, University of Pittsburgh, 1966

8 Brothers, Roy, "Arithmetic Computation: Achievement of Visually Handicapped Students in Public Schools", Exceptional Children, October 1972, Vol. 39

9 Crowley, Lake, and Rathgaber, A Comparison of the listening Ability of the Blind Student and Sighted Student in the Intermediate Grades, Fordham University, 1965

10 Davis, Flora, Inside Intuition: What We Know About Non-verbal Communication, New York: McGraw-Hill, 1973

11 DeRuyter, John, "The Training of a Blind Computer Programmer", New Outlook for the Blind, Vol. 62, 1968

12 Faulke, E., C. Amster, C. Nolan, and R. Bixler, "Comphrension of Rapid Speech by the Blind", Exceptional Children, November 1962, Vol. 29

13 Garrison, J. and Force, The Psychology of Exceptional Children, New York: Ronald Press Company, 4th Edition, 1965

14 Gottesman, Milton, "Stage Development of Blind Children: A Piagetian View", New Outlook for the Blind, Vol. 70, March 1976

15 Hanninen, Kenneth, Teaching the Visually Impaired, Columbus, Ohio: Charles E. Merrill, 1975

16 Hardy, R. E. and J. G. Gell, Social Rehabilitation Services for the Blind, Springfield: Charles C. Thomas, 1972

16.5 Hartlage, L. C. "Differences in Listening Comprehension of the Blind and Sighted", International Journal for the Education of the Blind, 1963, Vol. 13

17 Haupt, Charlotte: "Improving Blind Children's Perceptions", New Outlook for the Blind, Vol. 58, June, 1964

18 Hill, Everett, "The Formation of Concepts Involved in Body Position in Space" Education of the Visually Handicapped, Vol. 2 No. 1, December 1970

19 Jervis, F. M., "A Compansion of Self-Concepts of Blind and Sighted Children" Guidance Programs for Blind Children, Watertown, MA: Perkins School for the Blind, Publication No. 20

20 Karnes, M.--J. Wallersheim, "An Intensive Differential Diagnosis of Partially Sighted Children to Determine the Implications for Education", Exceptional Children, Vol. 30, September, 1963

21 Kent, H. R., "The Effect of Repeated Praise or Blame on the Work Achievement of Blind Children", Unpublished Doctoral Thesis, Columbia University, 1956

22 Kirk, Sam A., Educating Exceptional Children, Boston: Houghton-Mifflin Company, 2nd Edition, 1972

23 Lawerence, Mary, "Self Reliance Institute; Filling the Gap in Work Experience New Outlook for the Blind, Vol. 67, May 1973

24 McBride, Vearl G., "Explorations in Rapid Reading of Braille" New Outlook for the Blind, Vol. 68, January, 1974

25 Merry, Frieda K., "A Survey of the Problem Solving Ability of Pupils in Six Residential Schools for the Blind", Teacher's Forum 1931, Vol. 3

26 Morse, John L., "Answering Questions of Psychologist Assessing the Visually Handicapped Child", New Outlook for the Blind, October 1975, Vol. 69, No. 8

27 Mueller, Max, "Effects of Illustration Size on Test Performances of Visually LImited Children", Exceptional Children, Vol. 29, November 1962

28 Myers, William, "Color Discriminability for Partially Sighted Children" Exceptional Children, November 1971, Vol. 38

29 Nolan, Carson, and June Morris, "The Japanese Abacus as a Computational Aid for Blind Children", Exceptional Children, September 1964, Vol. 31

30 —, "Reading and Listening in Learning by the Blind", Exceptional Children, March 1963, Vol. 29

31 —, "A Study of Pictures for Large Type Textbooks", International Journal for the Education of the Blind, 1960, Vol. 9

32 Schaegel, T. F., "The Dominant Method of Imagery in Blind as Compared to Sighted Adolescents", Journal of Genetic Psychology, 1953, Vol. 83, pg. 265

33 Tobin, M. J., D. Clarke, J. Lane, and V. G. Pittman, "Programmed Learning for the Blind", Education of the Visually Handicapped, Vol. 2, No. 1, March 1970

34 Vanderkolk, Charles, "Physiological Measures as a Means of Assessing Reactions to the Disabled", New Outlook for the Blind, Vol. 70, March, 1976, No. 3

35 Warren, David, "Early vs. Late Vision: The Role of Early Vision in Spatial Reference Systems", New Outlook for the Blind, Vol. 68, April, 1974

36 Whiteman, M. A., "A Psychological Appraisal of Blindness" in Social Casework and Blindness, Finestone (Editor), New York: American Foundation for the Blind, 1960

Profile of EMI

Subject	Profile	Treatment
MMUNICATION SKILLS		
Listening	Has ability to follow verbal directions equal to normals on 1 direction. When 2-4 directions given at a time makes 2-3 times as many errors as normals in sequencing and accuracy. ⑥	(L) 1 verbal direction given at time would ensure close to 100% accuracy--if following correct sequence is important.
Speaking	Shows deficit in verbal expressive skills especially speed and logical associations (took longer to give the same number of responses as normals and even then responses were not the same caliber i.e. tended to use less categorical responses. ⑤ Auditory expressive language is 40% of normal achievement at age 15. ④	
Reading	Using programmed sentences learned 5 new sight words per hour as compared to 7 new words for normals. 90% retention shown after one month. (65)	Programmed instruction that can be self-paced might be used.

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) Items specifically for those with I.Q. 55 and below

Subject	Profile	Treatment
COMMUNICATION SKILLS		
Reading - Continued	Reading errors were: 31% of errors were saying word that began like correct word but ended differently. 16% word said, ended like correct word but began differently. 15% were medial vowel errors. 12% were reversals. ⑫ Uses context clues infrequently and has low phonetic word attack skills. ⑯ Silent reading level (CA 11-16) was 2.66 grade level, oral reading level was 1.88 grade level. ⑯ Silent reading rate was 151.8 words per minute (normals 157.5 words per minute) but comprehension was only 3/4 of MA (CA 8-10) matched normals. ⑯	Students tend to use beginning sounds and familiar configuration as their main word analysis pattern. Note: If technical words have familiar configuration extra practice sessions and/or intensified cues must be provided. Concentrate on base words.
Writing	Use of abstract meaning (as measured by the students written story about a picture) in written stories was only 1/2 that of normals. ④ Used only half as many words per sentence as normals and only 1/2 as many sentences per story. ④ Is significantly lower on vocabulary diversity. ③ Is deficit in syntax usage and punctuation ③	One study, students were taught to use visual imagery to remember pictures. Significantly better results were obtained. Visual imagery might be used to teach letters and words. (80) Kinetic or touch may be helpful.

(L) Items specifically for those with I.Q. 55 and below

Subject	Profile	Treatment
COMMUNICATION SKILLS Writing - Continued	Has knowledge of correctness of written language 3/4 of CA matched normals. ④	
	Frequent spelling mistakes were: silent letters, confusion of vowels, confusion of consonants and omission of syllables. (66)	Note: Common spelling mistakes highly correlated with reading problems. Program for extra practice session when technical words are to be instructed.
Thought Processing Variables	Can process a maximum of 3-4 digits or units of information for both the auditory and visual channels (normal 5-7). ⑧ ⑰	1. Most efficient input channel depends on the individual. 2. Will need to first determine which channel is prevalent in a particular student-if auditory, use primarily auditory input with visual secondary; if visual learner, vice versa. 3. Results are more effective if you use both visual and auditory modalities. ⑦ 4. Decrease in transmission rate raises the amount of information that can be processed while a decreased amount of information can be processed at a faster rate. For example, 2 digits could be processed accurately at a faster rate than could 4 digits. ⑧
	Does not take advantage of redundancy in everyday life situations. Cannot seem to group things to make processing more efficient. Seems to process everything in pieces rather than chunks. ①	Program to teach process of grouping like concepts and/or to scan and organize the given material. It is more effective initially to give students bits of organized information. ⑰ External cueing or outlining redundant material not effective with EMI. ①

Subject	Profile	Treatment
COMMUNICATION SKILLS Thought Processing Variables - Continued	Does not automatically scan and organize material for input. ⑰ (See also retention, memory)	Most effective when S-R pairs containing like material were temporally separated from other S-R pairs containing like response terms. Example: 7A then 5C then 6B 4A show 8C show 3B ①
Math	-Has great difficulty with the reading and language of arithmetic	Audio cassette tapes were used effectively to teach math combinations and spelling words. (62)
	-Lacks the skill to separate irrevelant facts from the significant. Has great difficulty in understanding and identifying which process should be used in solving a problem even when presented verbally. ㊷	
	-Performs reasonably like normals of equal MA in computation though usually they make more careless errors and exhibit greater incidence of primitive habits (making marks, counting on fingers). ㊷	Because of high frequency of careless errors, might want to program a process of monitoring their work and/or provision for immediate feedback.

(L) Items specifically for those with I.Q. 55 and below

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
General Assessment		
Intelligence	IQ 2 to 3 standard deviations below the mean on individual intelligence test (Michigan Mandatory law); usually means IQ. 50 - 70.	
	Usually obtains significantly higher WISC performance than verbal IQ.	
	Strengths appear in object assembly and picture completion subtests.	
	Weaknesses appear in vocabulary, information comprehension and arithmetic (short term memory) subtests. ⑬	
Achievement	Rate of development 1/2 - 3/4 of average student. (general achievement based on MA expectancy)	
	CA consistently bore negative relation to rate of achievement; the older the students were, the lower their rate of achievement. ⑬	
	Achievement is usually in lower 6 percentiles in reading and math on standardized achievement tests (Michigan Mandatory Qualifications)	This result lends support to the achievement levels received from ages 11-16 as equivalent or close to that found at later age.
	For grades 10 - 12 grade achievement level will range between 5.0 and 7.5 average about 6.3 based on mental age capacity for an IQ = 70. ㊼	

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Achievement - continued	Study showed the closer the IQ was to normal, the greater the discrepancy between achievement level expected based on mental age capacity and actual achievement level using the WRAT. For example, IQ 56-60 expected grade level 3.5, actual was 3.0; for IQ 61-65 expected grade level was 4.7, actual was 3.4; for IQ 71-75 expected grade level was 6.0, actual was 4.0; for IQ 76-80 expected grade level was 6.7, actual was 4.2. ㊸	**Note:** In working with the EMI group, the socially adept and high functioning students will need additional attention to help them achieve at their expectancy level. ⑤
Reading	Expected grade level attainment based on mental age capacity for a 16 year old in silent reading is between 3.0 and 5.0 actual silent reading level is between 1.4 and 3.4; expected grade level in oral reading is between 3.0 and 5.0 actual oral reading level is between 1.0 and 3.0, ⑯	
Math	Expected grade level attainment based on mental age capacity for a 16 year old is between 3.0 and 5.0 for arithmetic reasoning, actual grade level is between 1.0 and 3.0; expected grade level in arithmetic fundamentals (computation) is 3.0 - 5.0 actual grade level is between 2.5 and 4.5 (median = 3.83). ⑯	
Spelling	Expected grade level attainment based on mental age capacity for a 16 year old is between 3.0 and 5.0 in oral spelling, actual grade level is between .5 and 2.5 (median = 1.79) 16	When students were asked to set their own goals as to how many words they could learn to spell correctly - the number they learned to spell did increase. 2

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Attention	Short attention span (See listening and ability to follow directions).	If a reinforcer is valued by members of a group, the use of a reinforced model rather than individual instruction is possibly a more economic instructional technique. For example, to teach a particular skill such as making a bed properly, choose one of the students to be the model and reinforce him, while other students watch. If this method is used be sure to let each student have a chance to be the model and therefore get the reinforcement. ㊴ -Use color coding to focus attention. -Use wide spaces between items so each item gets the attention by itself and does not get lost among others on the page. -Emphasize key words and points to be learned; use underlining, arrows, circling etc. -Use pictures and illustrations whenever possible to aid both in explaining and attention getting. ㊹ Providing verbal cues (labels) also serves to increase attention. (78) Use double responding as a technique-student has to touch his choice before checking to see if it is correct. (69) Minimize non-essential verbalizations and eliminate confounding physical distractions, noise, movements, etc.

Subject	Profile	Treatment
KNOWLEDGE LEVEL Retention Memory	1) Memory span is 3-4 items (5-7 average) 2) Memory scanning is slower and less efficient than normals. For example, after being shown a sequence of numbers students were then shown another and asked if that number was one of the sequence. EMI students took longer to respond and answers were more frequently wrong than normals. (79) 3) Uses less pause time. 4) Retrieval time is 1/2 second behind normals. ㉕ 5) Average reaction time in the retrieval process was 1/2 that of normals. (67) Primary difference between EMI and normals is the speed and manner in which EMI scan and selectively organize the material for storage; they are slower and use no systematic organization method. Chaotic input makes for chaotic retrieval. ⑰ (See Communication skills, thought processing variables)	Rehearsal strategy for memorizing 6 digits: 1) Construct rehearsible chunk by attention alone (focus attention on first 3 digits) 2) Store first chunk for delayed retrieval by rehearsal (commit first 3 digits to memory by rehearsing over and over.) 3) Store next chunk for immediate recall (focus attention on next 3 digits but don't rehearse) 4) Expose probe (another number that is the same as one of the original 6 digits) 5) Search primary store, is probe there (review last 3 numbers attended to, is the probe one of them?) 6) If not, begin serial search of secondary store (review in order, the first three digits to see where probe is). ⑱ Rehearsal strategy: 1) Look at first stimulus, repeat its name. 2) Look at second stimulus, repeat its name, then repeat the name of first stimulus 3) Repeat this process each time repeating all stimulus presented before. ㉔ Note: Program should include cues by which they can organize the material. It is necessary to organize the information at input, giving them a process to follow. ⑰ Most research indicated that it is vital for the material to be organized and structured for them.

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Transfer of Training	Can transfer principles as well as MA (CA 8-10) matched normals when the elements are identical. (60)	Two factors influence the extent transfer will occur across tasks 1) Similarity of the training and the target tasks 2) Degree of initial mastery of the transferred strategy in order to facilitate transfer, practice some concept on variations of the task, but practice a lot. (74) They need to be taught how to apply skills to many and varied situations. (60) Teach student through the media and the materials that will be used in the real world. If role activities are used follow them up by practical application--when teaching abstract concepts emphasize the what and the how as opposed to the why. ㊹ For example, in teaching students to use a checking account, use real checks, bank books etc., give them many situations in which they could use a checking account paying bills, buying things etc.
Physical Status	Most deficient motor proficiency areas are equilibrium, performance balance, complex coordination (standing broad jump, backward beam walking, etc.) and manipulative dexterity. (As measured by Purdue Pegboard putting pegs in holes and Minnesota Rate of Manipulation Test) ㉗	Motor performance is most impaired on measures which require: 1) High incentive motivation for optimal performance (number of sit-ups in a minute) 2) Conceptual understanding of movement patterns demanding a sequence of response (squat thrusts or jumping jacks). 3) Movement patterns requiring simultaneous or sequential integration of various body parts (standing, broad jump). ㉗

Subject	Profile	Treatment
Physical Status - Continued	Height and weight equal to normals. Static grip strength 8 kilograms less than normals (CA 14) At no age level were EMI equal to the standard performance of the normal 8 year old-EMI were markedly inferior to normal children in all motor performance tests (static grip strength, running speed, distance throw, sit-ups, standing broad jump etc.) and that with advancing age the deviations from the normal tend to become greater. (73) Is 2 years behind CA matched normals on many gross motor tasks (69)(55).	Physical manipulation skills must be broken down into component parts and taught separately.
	On a classification task can handle variations of 2 dimensions (size and color) as well as normals but not 3 variables (color, size, and shape) ㉘	Students generally required more trials to reach criterion on tasks where color was the relevant dimension, than on tasks where either size or form was relevant-research shows students learn more slowly when their preferred dimension is not the relevant one in a discrimination task. ㉘
	On individual hand tests of manual dexterity (Purdue Pegboard) 25-30% did as good or better than normals (L) 42-59 IQ performing significantly lower on 19 out of 20 instances. (L) 42-69 IQ group could equal higher group when the task was simple (requiring a single hand) but dropped considerably when task became more complex (2 hand assembly) (L) Shows marked inability to perform tasks involving manual dexterity. (72)	Important note to vocational placement: Student should not be placed in an occupation which will require performance in the weakest area.

(L) Items specifically for those with
IQ 55 and below

Subject	Profile	Treatment
Channels of Receiving Information	Performs better on tests using the auditory-vocal channel as compared with those using the visual motor channel. ⑪ EMI ability to understand language received auditorily was 70% of normal at age 13-15; not reached a plateau. ④ Has a more lasting icon (memory after image) than normals which might interfere with rapid input of additional stimuli. Processing of repetitive stimuli is at a slower rate. ⑰ For example: writing down dictated numbers in a math class would have to be given at a slower pace. When verbal directions call for a written response, EMI achieved 50% of normal but when the response called for relating what they heard to the visual form (words, pictures) already reproduced, the achievement was 70%. ④	Students were videotaped at their work stations Nonproductive behaviors were viewed privately with student. Appropriate behaviors increased significantly. ⑨ ㊺ A successful training and teaching technique was the development of a manual using pictures of workers doing various tasks and the student had to write the text to go with the pictures. ㊶ Training a student on a serial task can accelerate his performance on a higher level organizational task. This teaches him to group stimuli into categories for recall. He will then automatically group data into categories. ㊿
Effects of Presentation Styles	When proper verbal mediators (labels) are supplied, storage of paired associates is quite good. ⑰ Verbal elaboration is a more effective strategy than highlighting physical characteristics (color coding) for the associative learning of pictorial stimuli. For example, students remembered more paired associates when they were told a story that somehow connected the pictures. (63) The study-test method (student is shown all of the paired associate cards at one time and is allowed to study them, then they are taken away, he is then shown one card and has	

Subject	Profile	Treatment
KNOWLEDGE LEVEL		
Effects of Presentation Styles - Continued	to supply the correct card) was a more effective presentation style for learning paired associate task than was the anticipation method (student was shown one paired associate set at a time, studied it then it was taken away and he was shown another. After seeing them all in this manner, the student was tested as in the above method). ㉓ On a classification task there was no significant difference in effectiveness using 3 dimensional as opposed to 2 dimensional instructional materials. (58) When students were instructed to imagine a picture (visual imagery) connecting pair of words, they were more successful than the verbal repetition group. The students also performed significantly better on the transfer task. (80) In Paired Associate research for high information material, simultaneous presentation is catastrophic. Feed in the material a little at a time. ⑰	
Serial Learning	Learning occured more readily with supportive verbal comments than under tangible incentive conditions. ㊱	

Subject	Profile	Treatment
ATTITUDES TOWARD SELF & OTHERS		
Self Evaluation	There is a close relationship between self concept and peer acceptance, (Low self concept, and low peer acceptance.) (57) More negative self concept than any other group (gifted, average and underachievers) and also showed a more negative ideal self concept. (54) (As determined by author made test, draw a person test and a teacher rating scale.) Large proportion saw themselves in service type jobs, but when asked what type of job they would like to have, the majority chose a higher level job (technical, clerical sales occupation, managerial, professional) discrepancy here. (59) -More defensive than normals -Trouble with their own concept of identity -Below average on self acceptance -Extremely negative in their perceptions of their own behavior -Had significantly more negative perception of their relations with others. They did not see themselves as adequate or of worth in their social interactions with people. ㊲ The lower the IQ the less unrealistic the job expectations (aspired to white collar jobs) Had less knowledge of a particular job and in most instances did not know why the selection was made. ㉛	
Ability to Function Under Stress and Frustration	Inspite of failure, greater persistence in making same responses to stimuli that had previously brought reward. ㉖ -Not able to accept criticism. ㊲	Retarded students have experienced partial reinforcement in their long term histories of frequent failures and so have learned to continue responding in similar manner in the presence of frustrating stimuli. ㉖

Subject	Profile	Treatment
ATTITUDES TOWARD SELF & OTHERS		
Achievement Motivation	Displayed motivational pattern of minimizing the risk of failure by low striving. For example: choosing a service job, because they were sure they could get one and do the job properly rather than aspiring to a blue collar job because they weren't sure they could get one and be successful at it. ㉛ -Sets goals below level of which the student is capable of achieving. ㊽	
Failure Set Pattern	Has a typically high expectancy for failure. This leads to avoidance of trying new experiences. (56) (68) Sets goals beneath the level the student is capable of achieving. Student then begins to overrely on external cues (facial expressions of teacher, other students behavior etc.) rather than his own cognitive processes. ㊽ Have generalized expectations of failure and respond to the threat of failure with decreased rather than increased effort. Normals tend to use failure as a cue to increase effort. ㉞	Use fading technique. Use lots of external cue to allow student to be successful while learning task, then once they begin to get some confidence gradually fade out external cues. ㊽ EMI boys had higher self concepts than normals, but had been raised in a totally segregated success oriented program, as a result they had unrealistic view of themselves. Total success is not the answer either. (61)
Perception of Others	Low SES students were wary of interacting with adults since in their social histories adults have reacted negatively towards them. They pull away and at the same time want the relationship ambiguous. (56)	

Subject	Profile	Treatment
ATTITUDES TOWARD SELF & OTHERS		
Perception of Others - Continued	-Employers regarded these traits as necessary for employability of EMI-good work habits, good personal habits, sound interpersonal behavior, respect for supervision, accept criticism, being on time. (70) (71) -Among reasons most frequently offered for not hiring EMI students were: personality clashes with employers and coworkers, and low social acceptance of EMI student. ㊵ -Students (Jr. High) hold negative stereotypes toward term mental retardation and this did not change even with contact with EMI's; ㉑	
CULTURE FACTORS IMPEDING LEARNING	33% of 1000 people interviewed interchanged mentally retarded and mental illness. 31% thought mental retardation could be cured so that the person would have normal intelligence. Acceptance of retarded is common on a community basis and lessens as intimacy of the relationship increases. ⑯ Out of 10 afflictions, being mentally retarded was rated least favorably-the one category no one wanted to be included in ㉒ Considerable agreement among persons exist on the traits attributable to mentally impaired: quiet, timid, abnormal, strange, helpless and clumsy. (51)	

Subject	Profile	Treatment
SOCIAL POSITION AS IT RELATES TO LEARNING		
Social Class Cues	Attended to socially irrelevant stimuli in simulated social situations will probably make frequent errors in interpretation of the social interaction. Student merely enumerates details of interaction. ㊳	Develop lessons that call attention to the variety of social signals used in the working world-illustrated by slides, tapes, role playing etc. Discuss the use of particular cues by which to identify expected patterns of behavior. ㊳
Learning Environment	Segregated placement patterns are not conducive to overall positive self concept. ㉝ Study compared homogenous and heterogenous groupings. EMI students concept of own intellectual ability above average in homogenous slow class and below average in heterogenous. On concept of self as a school learner, homogenous rated themselves significantly higher than herero.-mean number of contributions per class was 4.03 for homogenous and .86 for heterogenous. ㊻ (L) Responds to straight success the best. ⑳ Responds to the task better when moderate failure was interspersed with success. ⑳ Anticipation of a reward of own choosing facilitated learning rate when subjects expected to succeed, but inhibited learning rate when they expected to fail. ⑲ Students who were told they had the ability to perform the task adequately were not significantly influenced by the facilitating effects of promised reward. ⑲	

Subject	Profile	Treatment
SOCIAL POSITION AS IT RELATES TO LEARNING		
Reinforcement Feedback	Feedback in the form of right-wrong improves performance as compared to right-nothing (no response) or nothing (no response)-wrong. ㊱ In cognitive learning situation non-redundant, contingent and reliably structured social reinforcements were more effective. ㊱ Random or indiscriminant feedback not only impedes learning but can also lead to inattention. ㊱	Goal setting and verbal praise and encouragement seemed to be the most effective social reinforcers. ㉞ Use such comments as "keep up the good work" and "I like the way you are trying" for between instructional periods as they provide undesired stimuli (distractions) that can impede learning. ㊱ Delayed feedback has much less impact on learning. Feedback should be immediate and for short term tasks.
Punishment in Social System		A positive relationship with student before punishment is given, makes punishment more effective. Punishment should be applied early in the sequence of misbehavior and be consistently applied as it occurs. Giving a harsher punishment at the beginning, may be more effective than having to gradually increase the punishment Punishment must be accompanied by a specification of the behavior being punished for. Punishment is more effective if an alternative is available to the punished behavior and if th incompatible behavior is reinforced. (Example: punish getting out of seat but also reinforce staying in seat.) The same punishment should not be used over and over. Soft reprimands i.e. reprimands directed only at the involved student are probably more effective. ㉙

REFERENCES

1. Borys, S. R. and Spitz, H., Effects of Temporal Grouping and Redundancy, Level on the Paired-Association Learning of Retarded Adolescents and Nonretarded Children, American Journal of Mental Deficiency, 1974, 79/4, p. 443-448.

2. Warner, D. A. and DeJung, J. E., Effects of Goal Setting Upon Learning in Educable Retardates, American Journal of Mental Deficiency, 1971, 75/6, p. 681-684.

3. Sedlak, R. A. and Cartwright, G. P., Written Language Abilities of EMR and Nonretarded Children With the Same Mental Ages, American Journal of Mental Deficiency, 1972, 77, p. 95-99.

4. Myklebust, H. R., Development and Disorders of Written Language, Studies of Normal and Exceptional Children, 1973, Volume 2.

5. Harrison, R. H. and Others, Differences Between EMR and Nonretarded Children in Fluency and Quality of Verbal Associations, American Journal of Mental Deficiency, 1975, 79, p. 583-591.

6. Lent, J. R., Holovet, J. F., Ferneti, I. H., Keititz, I., and Tucker, D. J., Direction Following of Retarded and Nonretarded Adolescents, American Journal of Mental Deficiency, 1973, 78, p. 316-322.

7. McConkey, R. and Green, J., Presentation Method and the Free Recall Performance of Retarded Adults, American Journal of Mental Deficiency, 1973, 78, Volume 1, p. 95-97.

8. Spitz, H. H., The Channel Capacity of Educable Mental Retardates, in D. K. Routh, The Experimental Psychology Of Mental Retardation; (ED), Chicago, Aldine Publishing Company, 1973.

9. DeRoo, W. M. and Haralson, H. L., Increasing Workshop Production Through Self Visualization on Videotape, Mental Retardation, August 1971, Volume 9, p. 22-25.

11. Marinosson, G. L., Performance Profiles of Matched Normal Educationally Subnormal and Severly Subnormal Children on the Revised ITRA, Journal of Child Psychology and Psychiatry, April 1974, 15, p. 139-148.

REFERENCES
Page 2-Continued

12. Bennett, A., An Analysis of Errors in Word Recognition Made By Retarded Readers, Journal of Educational Psychology, 1942, 33, p. 25-38.

13. Schwartz, R. H. and Cook, J. J., Teacher Expectancy as it Relates to the Academic Achievement of EMR Students, Journal of Educational Research, May 1972, 65, p. 393-396.

14. Sattler, J. M., Assessment of Children's Intelligence, Philadelphia, W. B. Saunders Company, 1974.

15. Henderson, Lorraine J., Increasing Descriptive Language Skills in EMR Students, Mental Retardation, June 1971, 9, p. 13-16.

16. Dunn, L. M., A Comparison of the Reading Processes of Mentally Retarded and Normal Boys of the Same Mental Age, Monograph of the Society for Research and Child Development, 1956, 19, p. 7-99.

17. Spitz, H. H., Consolidating Facts into the Schematized Learning and Memory System of the Educable Retardates in N. R. Ellis, International Review of Research in Mental Retardation; (ED), New York, Academic Press, 1973, Volume 6, p. 149-168.

18. Butterfield, E. C. and Wambold, C., Belmont, J. M., On the Theory and Practice of Improving Short-Term Memory, American Journal of Mental Deficiency, 1973, 77/5, p. 654-669.

19. Welch, R. F. and Drew, C. J., Reward Anticipation and Performance Expectancy on the Learning Rate of EMR Adolescents, American Journal of Mental Deficiency, 1972, 77, Volume 2, p. 291-295.

20. McGee, J. E., Moderate Failure as as Instructional Tool, Exceptional Child, Summer 1970, 36, p. 757-761.

21. Strauch, J. D., Social Contact as a Variable in the Expressed Attitudes of Normal Adolescents Toward EMR Pupils, Exceptional Child, March 1970, 36, p. 495-499.

22. Shears, L. M. and Jensema, C. J., Social Acceptability of Anonalous Persons, Exceptional Child, October 1969, 56, p. 91-96.

REFERENCES

23. Winters, J. J., Attler, L. C., and Harvey, F., Paired Associate Learning of EMR Adolescents and Nonretarded Children as a Function of Methods of Presentation and Training, American Journal of Mental Deficiency, 1974, 79, p. 70-76.

24. Turnbull, A. P., Teaching Retarded Persons to Rehearse through Cumulative Overt Labeling, American Journal of Mental Deficiency, November 1974, 79, p. 331-337.

25. Butterfield, E. C. and Belmont, J. M., Richard L. Schielferbusch (ED), The Role of Verbal Processes in Short Term Memory in Language of the Mentally Retarded, Baltimore, Maryland, University Park Press, 1972, p. 231-247.

26. Viney, L. L., Clark, A. M., and Lord J., Resistence to Extinction and Frustration in Retarded and Nonretarded Children, American Journal of Mental Deficiency, 1973, Volume 78, p. 308-315.

27. Bruininks, R., Physical and Motor Development of Retarded Persons in N. R. Ellis (ED), International Review of Research in Mental Retardation, New York, Academic Press, 1974, Volume 7, p. 209-253.

28. Gruen, G. E. and Berg, B., Visual Discrimination Learning in Famial Retarded and Nonretarded Children, American Journal of Mental Deficiency, 1973, 78/1, p. 63-69.

31. Folman, R. and Budoff, M., Learning Potential and Vocational Aspirations of Retarded and Nonretarded Children, Exceptional Child, October 1971, 38, p. 121-130.

33. Lawrence, E. A. and Winschel, J. F., Self Concept and the Retarded: Research and Issues, Exceptional Child, January 1973, 39, p. 310-319.

37. Collins, H. A. and Burger, C. K., The Self Concepts of Adolescent Retarded Students, Education and Training of the Mentally Retarded, February 1970, 5, p. 23-29.

38. Edmonson, B., Leland, H. and Leach, E. M., Social Inference Training of Retarded Adolescents, Education and Training of the Mentally Retarded, December 1970, 5, p. 169-175.

39. Brown, L. and Foshee, J. G., Comparative Techniques for Increasing Attending Behavior of Retarded Students, Education and Training of the Mentally Retarded, February 1971, 6, p. 20-24.

REFERENCES

Page 4 - Continued

40. Howe, C. E., Monroe, D., Effects of Integration and Social Class on the Acceptance of Retarded Adolescents, Education and Training of the Mentally Retarded, February 1971, 6, p. 20-24.

41. Weisenstein, G. R., Using a Pictorial Job Training Manual in an Occupational Training Program for High School EMR Students, Education and Training of the Mentally Retarded, February 1975, 10, p. 30-35.

42. Smith, R. M., Clinical Teaching: Methods of Instruction for the Retarded, New York, McGraw Hill, 1968.

43. Schwartz, R., Mental Age as it Relates to School Achievement Among Educable Mentally Retarded Adolescents, Education and Training of the Mentally Retarded, 1969, 4, p. 53-56.

44. Justen, J. E. and Lambarde, Instructional Implications of Learning Characteristics of the Mentally Retarded, Journal of Special Education for the Mentally Retarded, Fall 1974, 11, p. 56-60.

45. Gajewski, F. J., Using Video Tape as a Learning Tool in Special Education Prevocational Programs, Journal of Special Education for the Mentally Retarded, Fall 1974, 11, p. 53.

46. Drews, E. M., R. L. Schiefelbusch, R. H. Copeland and J. O. Smith (ED), The Slow Learner Grouping Patterns and Classroom Communication, Language and Mental Retardation, New York, Holt Rinehart and Winston, Incorporated, 1967.

47. Johnson, O. J., Education for the Slow Learners, Englewood Cliffs, NJ, Prentice-Hall Incorporated, 1963.

48. MacMillan, D. L., The Problem of Motivation in Education of the Mentally Retarded, Exceptional Children, 1971, 37, p. 379-586.

49. Rarick, G. L., Weddoj, J. H. and Broadhead, G. D., Physical Fitness A 1 (Motor Performance of Educable Mentally Retarded Children), Exceptional Child, 1970, 36, p. 509-519.

50. Sitton, S. C., Categorization of Material Following Transfer From Serial to Free Recall Lists With EMR's, Mental Retardation, February 1975, Volume 13, p. 28-29.

REFERENCES

Page 5 - Continued

51. Guskin, S. L. Measuring the Strength of the Stereotype of the Mental Defective, American Journal of Mental Deficiency, 1963, 67/4, p. 569-575.

52. Cohen, J. S., Employer Attitudes Toward Hiring Mentally Retarded Individuals, American Journal of Mental Deficiency, March 1963, 67, p. 705-713.

53. Smith, R. M. and Neisworth, J. T., A Functional Approach, Exceptional Child, New York, McGraw Hill, 1975.

54. Curtis, L., A Compariative Analysis of the Self Concept of the Adolescent Mentally Retarded in Relation to Certain Groups of Adolescents, Dissertation Abstracts, 1965, 25, p. 2846-2847.

55. Bealer, J. D., The Performance of Educable Mentally Handicapped and Intellectually Normal Children on Selected Tasks Involving Simple Motor Performance, Dissertation Abstracts, 1960.

56. MacMillan, D. L., Motivational Style: An Important Consideration in Programs for EMR Labeled Children, Journal of Scholastic Psychology, June 1972, 10, p. 111-116.

57. Howard, D. P., Stainbeck, S. B., and Stainbeck, W. C., Relationship Between Self-Concept and Peer Acceptance, Journal of Scholastic Health, February 1972, 4 p. 109-110.

58. Whorton, J. E. and Straw, L. G., Dimensional Effects of Instructional Materials, Journal of Special Education, Fall 1973, 7, p. 251-254.

59. Knight, O. B., Occupational Aspirations of the Educable Mentally Retarded, Training School Bulletin, August 1972, 69, p. 54-57.

60. Johnson, O. G., Comparative Studies of Some Learning Characteristics in Mentally Retarded and Normal Children of the Same Mental Age, HEW-Office of Educational Research Contract, 1958, SAE-6446.

61. Lewis, T., Self Concepts of Adolescent Educationally Subnormal Boys, Educational Research, November 1972, 15, p. 16-20.

62. Hofmeister, A., Audio-Tutorial Programming With Exceptional Children, Educationa Technology, December 1973, 13, p. 50-52.

63. Bender, N. N. and Taylor, A M., Instructional Treatments Based on Learning Strategies and the Recognition Memory of Retarded Children, American Educational Research Journal, Fall 1973, 10, p. 337-343.

66. Tordrup, S. A., Reversals in Reading and Spelling, Slow Learning Child, March 1966, Volume 12, p. 173-185.

67. Dugas, J. L. and Kellas, G., Encoding and Retrieval Processes in Normal Children and Retarded Adolescents, Journal of Exceptional Child Psychology, February 1974, 17, p. 177-185.

68. MacMillan, D. L. and Keogh, B. K., Normal and Retarded Children's Expectancy for Failure, Developmental Psychology, May 1971, Volume 4, 3, p. 345-348.

69. Wunderlick, R. A., Titration and Double Responding as Techniques Promoting Proficient Learning in Retardates, Journal of Exceptional Child Psychology, December 1971, 12, p. 279-288.

70. Niziol, H. M. and DeBlassie, R. R., Work Adjustment and the EMR Adolescent, Journal of Employment Counseling, December 1972, 9, p. 158-166.

71. Kolstoe, O. P., An Examination of Some Characteristics Which Discriminate Between Employed and Nonemployed Retarded Males, American Journal of Mental Deficiency, 1961, 66, p. 472-482.

72. Cantor, G. N. and Stacey, C. L., Manipulative Dexterity in Mental Defectives, American Journal of Mental Deficiency, 1951, 56, p. 401-410.

73. Francis, R. J. and Rarick, G. L., Motor Characteristics of the Mentally Retarded, American Journal of Mental Deficiency, 1959, 63, p. 792-811.

74. Brown, A. L., Campione, J. C. and Murphy, M. D., Keeping Track of Changing Variables: Long-Term Retention of a Trained Rehersal Strategy by Retarded Adolescents, American Journal of Mental Deficiency, 1974, Volume 4, 78, p. 446-453.

76. Latimer, Ruth, Current Attitudes Toward Mental Retardation, Mental Retardation, October 1970, Volume 8, p. 30-32.

REFERENCES
Page 7 - Continued

79. Harris, G. J. and Fleer, R. E., High Speed Memory Scanning in Mental Retardates: Evidence for a Central Processing Deficit, Journal of Experimental Child Psychology, January 1974, 17, p. 252-259.

80. Zupnick, J. J. and Meyer, P. A., Long-Term Effectiveness of Imagery Instructions With Retarded Persons, American Journal of Mental Deficiency, March 1975, 79, p. 519-525.

Multiple Learning Strategies Project
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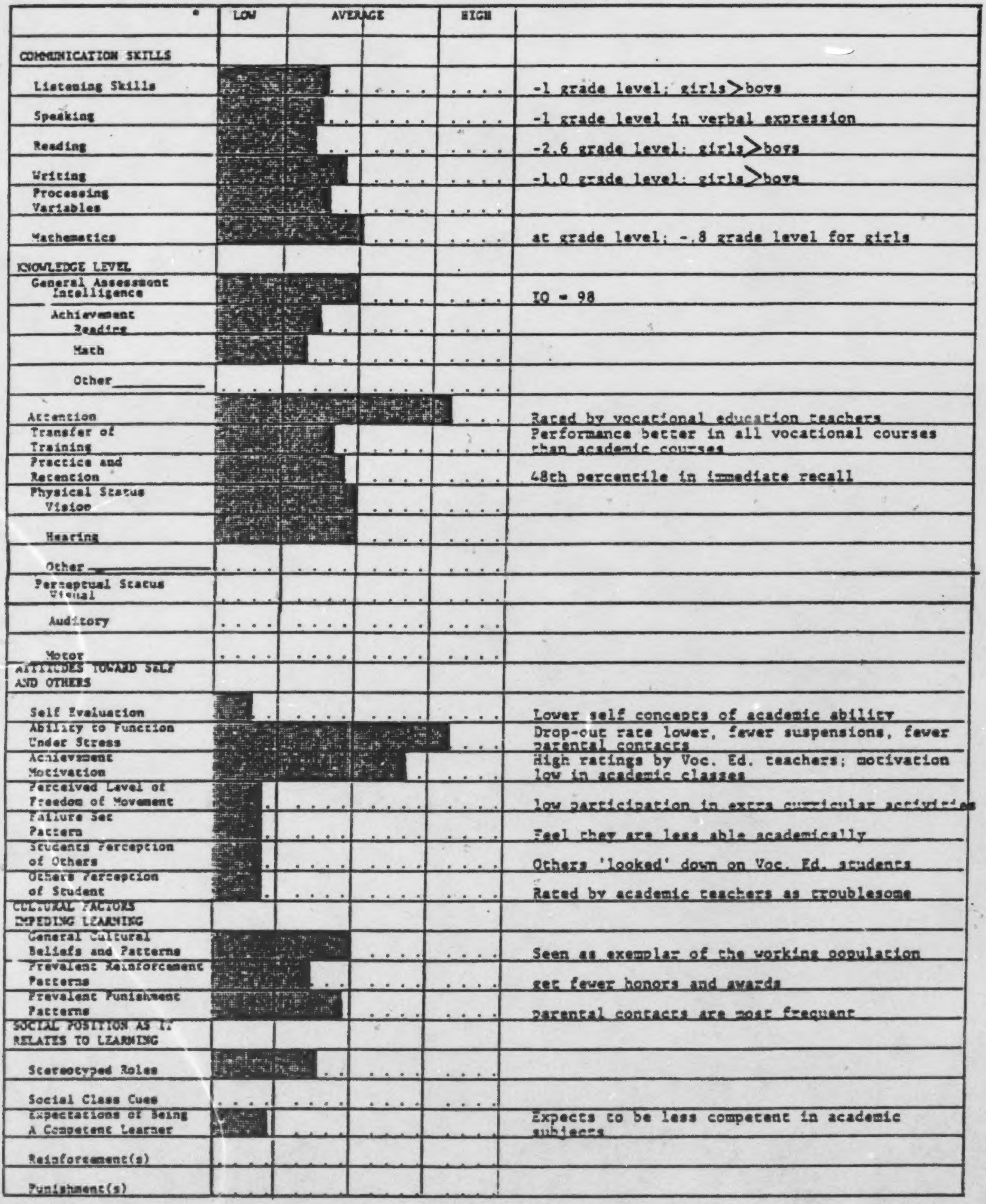
Profile of Regular Vocational Ed. Students



*	LOW	AVERAGE		HIGH	
COMMUNICATION SKILLS					
Listening Skills					-1 grade level; girls>boys
Speaking					-1 grade level in verbal expression
Reading					-2.6 grade level; girls>boys
Writing					-1.0 grade level; girls>boys
Processing Variables					
Mathematics					at grade level; -.8 grade level for girls
KNOWLEDGE LEVEL					
General Assessment Intelligence					IQ = 98
Achievement Reading					
Math					
Other_____________					
Attention					Rated by vocational education teachers
Transfer of Training					Performance better in all vocational courses than academic courses
Practice and Retention					48th percentile in immediate recall
Physical Status Vision					
Hearing					
Other ___________					
Perceptual Status Visual					
Auditory					
Motor					
ATTITUDES TOWARD SELF AND OTHERS					
Self Evaluation					Lower self concepts of academic ability
Ability to Function Under Stress					Drop-out rate lower, fewer suspensions, fewer parental contacts
Achievement Motivation					High ratings by Voc. Ed. teachers; motivation low in academic classes
Perceived Level of Freedom of Movement					low participation in extra curricular activities
Failure Set Pattern					Feel they are less able academically
Students Perception of Others					Others 'looked' down on Voc. Ed. students
Others Perception of Student					Rated by academic teachers as troublesome
CULTURAL FACTORS IMPEDING LEARNING					
General Cultural Beliefs and Patterns					Seen as exemplar of the working population
Prevalent Reinforcement Patterns					get fewer honors and awards
Prevalent Punishment Patterns					parental contacts are most frequent
SOCIAL POSITION AS IT RELATES TO LEARNING					
Stereotyped Roles					
Social Class Cues					
Expectations of Being A Competent Learner					Expects to be less competent in academic subjects
Reinforcement(s)					
Punishment(s)					

* The increments shown on the chart are approximates and should not be used as absolute values. The low increments would indicate that there is a problem in that category in comparison to an "average" population and the variable will need some attention. The high increments would correspondently indicate strengths in the specified population.

Profile of Visually Impaired Students

*	LOW	AVERAGE		HIGH	
COMMUNICATION SKILLS					
Listening Skills	▨	▨			Comprehension is not appreciably diminished at 225-275 w.p.m.
Speaking	▨	▨			Some problems of volume and rate.
Reading	▨				More difficulty in sequencing and deductive reasoning tasks; average reading rate is 120 w.p.m.
Writing	▨				Handwriting poor; no differences in grammatical abilities.
Processing Variables	▨				Has deductive reasoning problems.
Mathematics	▨				Computation levels 16-20% below sighted.
KNOWLEDGE LEVEL					
General Assessment Intelligence	▨	▨			Somewhat lower on "Thinking" or reasoning items.
Achievement Reading	▨	▨			1-2 grade levels below standards.
Math	▨	▨			.96-1 grade below standards.
Other ________					
Attention					
Transfer of Training					
Practice and Retention	▨				Three times as many practice sessions seen as minimum.
Physical Status Vision	▨				Glare will be problem for all levels of disability.
Hearing	▨	▨	▨	▨	No difference in acuity; heightened ability for discrimination.
Other ________					
Perceptual Status Visual	▨				Problems most evident with figure-ground presentations.
Auditory					
Motor					
ATTITUDES TOWARD SELF AND OTHERS					
Self Evaluation	▨				Generally less able to accept impairment.
Ability to Function Under Stress	▨				Behavioral pattern to stress; short steps, stiff limbs, dropped head.
Achievement Motivation					
Perceived Level of Freedom of Movement	▨				Reluctant to voice concerns for better viewing.
Failure Set Pattern					
Students Perception of Others					
Others Perception of Student	▨				Usually unfavorable based on inappropriate social habits, poor physical appearance, & lack of competitive attitude.
CULTURAL FACTORS IMPEDING LEARNING					
General Cultural Beliefs and Patterns	▨				Employers are afraid of hiring because of increased insurance rates and low production rates.
Prevalent Reinforcement Patterns	▨				Reinforcement of handicapped-helpless position.
Prevalent Punishment Patterns					
SOCIAL POSITION AS IT RELATES TO LEARNING					
Stereotyped Roles	▨				Misconceptions of "Sixth sense," and being universally kind, patient and unable to earn a living.
Social Class Cues	▨				Awkward in new situations.
Expectations of Being A Competent Learner					
Reinforcement(s)					
Punishment(s)					

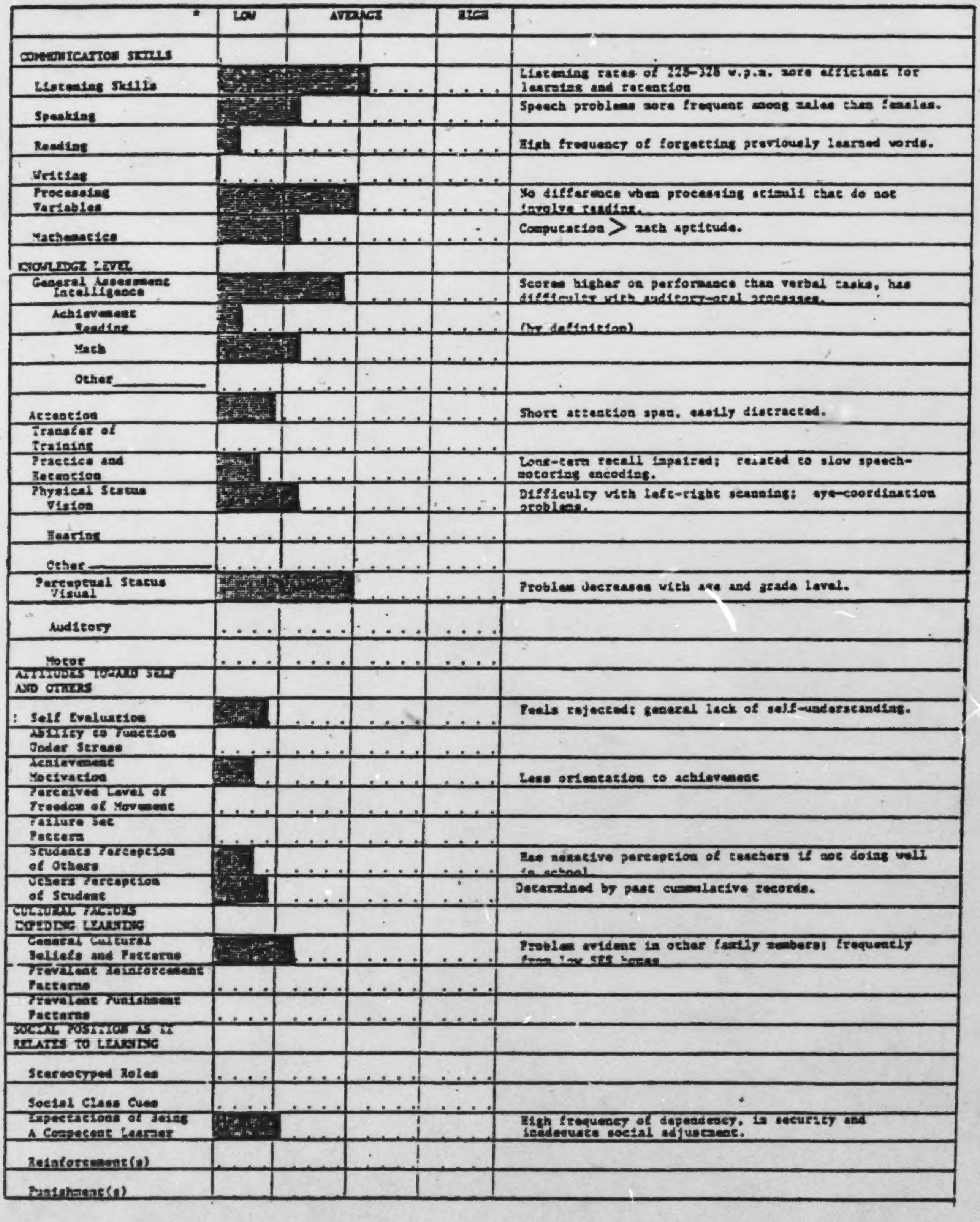
* The increments shown on the chart are approximates and should not be used as absolute values. The low increments would indicate that there is a problem in that category in comparison to an "average" population and the variable will need some attention. The high increments would correspondently indicate strengths in the specified population.

Profile of EMR Students

*	LOW	AVERAGE		HIGH	
COMMUNICATION SKILLS					
Listening Skills	▨				Sequencing and accuracy problems.
Speaking	▨				Tends to use less categorical responses.
Reading	▨				Word attack skills centered around beginning sounds and familiar configuration.
Writing	▨				Low on vocabulary, syntax usage, punctuation.
Processing Variables	▨				Has difficulty with scanning and organizing material.
Mathematics	▨				Computation > aptitude; has difficulty with language of math.
KNOWLEDGE LEVEL					
General Assessment Intelligence	▨				Higher performance than verbal.
Achievement Reading	▨				Actual achieved reading performance lower than expected; silent reading level is between 1.6 and 3.0.
Math	▨				Arithmetic reasoning grade level is between 1.0 and 3.0; arithmetic computation is between 2.5 and 4.5.
Other Spelling	▨				Spelling grade level is between .5 and 2.5.
Attention	▨				
Transfer of Training	▨	▨			Only when the elements are identical to those used when learning the concepts
Practice and Retention	▨				Memory span is 3-4 items as compared to the average 5-7.
Physical Status Vision	▨	▨			No significant difference.
Hearing	▨	▨			No significant difference.
Other Motor	▨				Lower performances in manual dexterity and gross motor tasks
Perceptual Status Visual					
Auditory					
Motor					
ATTITUDES TOWARD SELF AND OTHERS					
Self Evaluation	▨				More negative self concept than any other group.
Ability to Function Under Stress	▨				Greater persistence in making same response in spite of failure.
Achievement Motivation	▨				Chose low striving pattern more frequently.
Perceived Level of Freedom of Movement	▨				
Failure Set Pattern	▨				Has a high expectancy for failure; high avoidance reaction.
Students Perception of Others	▨				Wary of interacting with adults.
Others Perception of Student	▨				Negative stereotypes did not change with increased contact.
CULTURAL FACTORS IMPEDING LEARNING					
General Cultural Beliefs and Patterns	▨				Least favorably rated category.
Prevalent Reinforcement Patterns					
Prevalent Punishment Patterns					
SOCIAL POSITION AS IT RELATES TO LEARNING					
Stereotyped Roles					
Social Class Cues	▨				Makes frequent errors in social interaction interpretations.
Expectations of Being A Competent Learner					
Reinforcement(s)					
Punishment(s)					

* The increments shown on the chart are approximates and should not be used as absolute values. The low increments would indicate that there is a problem in that category in comparison to an "average" population and the variable will need some attention. The high increments would correspondently indicate strengths in the specified population.

Profile of Non-Reading Students



*	LOW	AVERAGE		HIGH	
COMMUNICATION SKILLS					
Listening Skills	▨	▨	....	....	Listening rates of 228-328 w.p.m. more efficient for learning and retention
Speaking	▨	....	....	....	Speech problems more frequent among males than females.
Reading	▨	....	....	....	High frequency of forgetting previously learned words.
Writing	....	....	....	....	
Processing Variables	▨	▨	....	....	No difference when processing stimuli that do not involve reading.
Mathematics	▨	....	....	....	Computation > math aptitude.
KNOWLEDGE LEVEL					
General Assessment Intelligence	▨	▨	....	....	Scores higher on performance than verbal tasks, has difficulty with auditory-oral processes.
Achievement Reading	▨	....	....	....	(by definition)
Math	▨	....	....	....	
Other ________	....	....	....	....	
Attention	▨	....	....	....	Short attention span, easily distracted.
Transfer of Training	....	....	....	....	
Practice and Retention	▨	....	....	....	Long-term recall impaired; related to slow speech-motoring encoding.
Physical Status Vision	▨	....	....	....	Difficulty with left-right scanning; eye-coordination problems.
Hearing	....	....	....	....	
Other ________	....	....	....	....	
Perceptual Status Visual	▨	▨	....	....	Problem decreases with age and grade level.
Auditory	....	....	....	....	
Motor	....	....	....	....	
ATTITUDES TOWARD SELF AND OTHERS					
Self Evaluation	▨	....	....	....	Feels rejected; general lack of self-understanding.
Ability to Function Under Stress	....	....	....	....	
Achievement Motivation	▨	....	....	....	Less orientation to achievement
Perceived Level of Freedom of Movement	....	....	....	....	
Failure Set Pattern	....	....	....	....	
Students Perception of Others	▨	....	....	....	Has negative perception of teachers if not doing well in school.
Others Perception of Student	▨	....	....	....	Determined by past cummulative records.
CULTURAL FACTORS IMPEDING LEARNING					
General Cultural Beliefs and Patterns	▨	....	....	....	Problem evident in other family members; frequently from low SES homes
Prevalent Reinforcement Patterns	....	....	....	....	
Prevalent Punishment Patterns	....	....	....	....	
SOCIAL POSITION AS IT RELATES TO LEARNING					
Stereotyped Roles	....	....	....	....	
Social Class Cues	....	....	....	....	
Expectations of Being A Competent Learner	▨	....	....	....	High frequency of dependency, in security and inadequate social adjustment.
Reinforcement(s)					
Punishment(s)					

* The increments shown on the chart are approximates and should not be used as absolute values. The low increments would indicate that there is a problem in that category in comparison to an "average" population and the variable will need some attention. The high increments would correspondently indicate strengths in the specified population.

TREATMENT PROFILE

	EMI	VISUAL IMPAIRMENT	REGULAR VOCATIONAL	NON-READING
Reading				
Level:	1) Expected: 3.0 - 5.0 grade level Actual 1.0 - 3.0 grade level	1) 1 - 2 grade levels below	1) 2.6 grade levels below	1) Most have little trouble with basic sight words. Often have difficulty when have to use phonetic skills—program for high 2nd. - low 3rd.
Size:		18,24,32 point type; 18 most frequent		1) Use one form in your typing, difficult to read both upper and lower case print.
Materials:		Use low glare paper		2) Use reading line widths 14 - 30 picas, 1 - 4 points leading, 6 point type size; candle power between 10+ to 25
Graphics:		Figure must be on a clear unconfusing background. Outline significant features of a graph, map, or diagram with black marking pen. 1-Enlarge maps, graphs and eliminate all but essential details. 2-Lettering must be clear and well-spaced——double spaced lines and between words. A traced picture (line drawing) with areas blacked in for contrast. Enlarge pictures to no larger than 8" by 11"——Keep them simple and to one feature. Use dark color on pale color; pale on dark: black-white is best.	Pictoral presentation should be relevant and arranged so as to call for active responding.	Use graphic representations frequently with unfamiliar material.
ite/Concept	Decrease in transmission rate raises the amount of information that can be processed while a decreased amount of information can be processed at a faster rate (need to know whether goal is information or speed).			
Format:	Need to help them to group like concepts and/or to scan and organize the given material - teach to example.	1) Need some instruction on spatial orientation and organization. 2) Teach concept in structured units where each part is connected to the whole; concepts presented in isolation will not be remembered.		1) Questions placed after the written passages facilitated retention more than questions placed before the passages. 2) Match phrases & sentences with pictures. 3) Might want to use SQ3R study method (survey, question, reading, reciting, reviewing).
Retention:	Verbal elaboration (relating a story, putting labels) was a more effective strategy than highlighting physical characteristics for the associative learning of pictorial stimuli.	Increased with discussion; questioning necessary to determine extent of knowledge		1) To understand entire selection more effectively teach concepts of author's purpose, organizational plan, subordinate ideas that support the main idea. 2) Spaced or distributed recalls are advantageous for retention.
Suggestions:	Use color coding to focus attention. Use wide spaces between items so each item gets the attention by itself. Emphasize key words and points to be learned; use underlining, arrows, circling. Provide verbal cues (labels).	1) Correlate printed or brailled materials with audio to get best comprehension 2) Extension of time limits might increase comprehension 3) Color code most significant points or features to be referred to in discussions.	1) To increase comprehension, place important concepts/words in simple, explanatory sentences prior to assignment of text reading.	Use short and personalized statements; sentence should be written in simple active voice declarative form.
Reinforcement:				Token reinforcement program seem to maintain attention especially concrete rewards & priviledges.

Graphics:		Figure must be on a clear unconfusing background. Outline significant features of a graph, map, or diagram with black marking pen. 1-Enlarge maps, graphs and eliminate all but essential details. 2-Lettering must be clear and well-spaced—double spaced lines and between words. A traced picture (line drawing) with areas blacked in for contrast. Enlarge pictures to no larger than 8" by 11"—Keep them simple and to one feature. Use dark color on pale color; pale on dark: black-white is best.	Pictoral presentation should be relevant and arranged so as to call for active responding.	Use graphic representations frequently with unfamiliar material.
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Format:	Need to help them to group like concepts and/or to scan and organize the given material - teach to example.	1) Need some instruction on spatial orientation and organization. 2) Teach concept in structured units where each part is connected to the whole; concepts presented in isolation will not be remembered.		1) Questions placed after the written passages facilitated retention more than questions placed before the passages. 2) Match phrases & sentences with pictures. 3) Might want to use SQ3R study method (survey, question, reading, reciting, reviewing).
Retention:	Verbal elaboration (relating a story, putting labels) was a more effective strategy than highlighting physical characteristics for the associative learning of pictorial stimuli.	Increased with discussion; questioning necessary to determine extent of knowledge		1) To understand entire selection more effectively teach concepts of author's purpose, organizational plan, subordinate ideas that support the main idea. 2) Spaced or distributed recalls are advantageous for retention.
Suggestions:	Use color coding to focus attention. Use wide spaces between items so each item gets the attention by itself. Emphasize key words and points to be learned; use underlining, arrows, circling. Provide verbal cues (labels).	1) Correlate printed or brailled materials with audio to get best comprehension 2) Extension of time limits might increase comprehension 3) Color code most significant points or features to be referred to in discussions.	1) To increase comprehension, place important concepts/words in simple, explanatory sentences prior to assignment of text reading.	Use short and personalized statements; sentences should be written in simple active voice declarative form.
Reinforcement:				Token reinforcement program seem to maintain attention especially concrete rewards & priviledges.
[illegible]				
Levels	Expected computation: 3.0 - 5.0 Actual computation level: 2.5 - 4.5	.86 - 1 grade below standards Might want to use abacus for computation to increase speed and accuracy.	Males: grade level Females: slightly below grade level.	1) Might want to emphasize translating meaning of words into mathematics symbols. 2) Work conjointly on math and reading skills.
DIO				
Directions:	Accuracy: 1 direction at a time.			
Rate:		Comprehension of material best at 175 wpm, not appreciably diminished at 225 - 275 wpm.	Compressed speech option appears to enhance learning.	Listening rates of 228 - 328 wpm more efficient for both learning and retention than the normal rate of 175 wpm.
Sound Level:				Amplify sound; might develop some listening skills (whispering).
Suggestions:			1) Program might include tape presentations that provide directions for psycho-motor tasks.	Because of high frequency of impaired auditory memory span and/or ability to sequence, program for auditory discrimination.
ffectiveness:	Need to teach math combinations and spelling words.		1) Caution: try to build in a monitoring of receipt of correct information.	Use only with familiar materials.

TREATMENT PROFILE

	EMH	VISUAL IMPAIRMENT	REGULAR VOCATIONAL	NON-READING
-VISUAL [illegible]				Material should be presented either by a slower-than-average or self-pacing procedure. Present material of importance in center of screen; has difficulty with left-right visual scanning.
cial Responses:	Develop lessons that call attention to the variety of social signals used in working world.			
d Level:				Amplify sound.
ectiveness:	Use of video tape (at work station) to increase appropriate work behavior.			
ICE				
s:	More trials were required to reach criterion on tasks where color was the relevant dimension than on tasks where either size or form was relevant.	Behavioral reaction to stress: shortening of steps, stiffening of limbs, dropping of head		
rials:		Use dull finished paper and desks. Artificial lighting produces less glare than direct sunlight. No flickering light; provide extra lighting equipment—high intensity lamps, multi-switch lighting. Have desks with top adjustable for light and angles or workneed to bring work close to eyes.		
nsfer	Provide similarity of the training and job tasks.		Introduce one new skill at a time.	
ations:		Call student by name to establish eye-contact. Provide guidance to sound-source identification.	Use attention signals, task signals, stimulus directions and prompts, response directions and prompts, and "do it" signals (p. 4, 5)	
s:		At least 3 times as many practices as seen as minimum (repeat process) or 1.5 times longer.		
gestions:	Might want to use visual imagery. Because of high frequency of careless errors, might want to program a process of monitoring their work and/or provision for immediate feedback. Use double responding-student has to make choice (touch, write etc.) before checking to see if it is correct. Provide rehearsal (process) strategy e.g. look at 1st. part, repeat its name etc. Might want to use pictures of workers doing various tasks and have student write text to go with the pictures.	Instruction should be in very concrete terms; using as many actual objects as possible. Present as much tactual material as possible with verbal discussions. Provide cues for better visual discrimination (see page 6 - 7 for suggestions). In tasks that require movement or source location, provide student with a reference point, either tactual or auditory. Provide training for increased eye-contact.	Prompts should initially be given but quickly faded out until the new situation provides the needed one. Might want to use more live or filmed modeling procedures in teaching physical-oriented tasks e.g. laying tiles, changing flourescent bulb. In addition to competency check, need to develop skills of dependability—following orders, being on time.	In either classification and discrimination tasks, be sure that the items are either discrete and/or the dimensions to be noted are either graphically or verbally specified. Cartoon character(s) might be used to increase attention and motivation.
ponses:	Will have difficulty with expressive language. Will use only 1/2 as many words in sentences (written). Will have higher response level to directions if response called for relating what they heard to the visual form (words, pictures) already produced.	Provide reminder for student to check tone and rate of speech (loud-soft, too fast-too slow). Provide opportunities for "question and answer" periods. Written responses: use paper with widely spaced lines; provide cues to have the student use manuscript and space between words.		To gain accurate knowledge of process: have student either write or recite process sequence; read written process sequence; and analyze what was wrong. Immediate comprehension favors a visual presentation; long term comprehension favors an auditory presentation.
rcement terms:	Supportive verbal comments > tangible reinforcements.		Build in primary reinforcement of success and mastery of materials.	

ICE				
es	More trials were required to reach criterion on tasks where color was the relevant dimension than on tasks where either size or form was relevant.	Behavioral reaction to stress: shortening of steps, stiffening of limbs, dropping of head		
erials:		Use dull finished paper and desks. Artificial lighting produces less glare than direct sunlight. No flickering light; provide extra lighting equipment—high intensity lamps, multi-switch lighting. Have desks with top adjustable for light and angles or workmood to bring work close to eyes.		
efer	Provide similarity of the training and job tasks.		Introduce one new skill at a time.	
entions:		Call student by name to establish eye-contact. Provide guidance to sound-source identification.	Use attention signals, task signals, stimulus directions and prompts, response directions and prompts, and "do it" signals (p. 4, 5)	
es		At least 3 times as many practices as seem as minimum (repeat process) or 1.5 times longer.		
gestions:	Might want to use visual imagery. Because of high frequency of careless errors, might want to program a process of monitoring their work and/or provision for immediate feedback. Use double responding-student has to make choice (touch, write etc.) before checking to see if it is correct. Provide rehearsal (process) strategy e.g. look at loc. part, repeat its name etc. Might want to use pictures of workers doing various tasks and have student write text to go with the pictures.	Instruction should be in very concrete terms; using as many actual objects as possible. Present as much tactual material as possible with verbal discussions. Provide cues for better visual discrimination (see page 6 - 7 for suggestions). In tasks that require movement or source location, provide student with a reference point, either tactual or auditory. Provide training for increased eye-contact.	Prompts should initially be given but quickly faded out until the new situation provides the needed one. Might want to use more live or filmed modeling procedures in teaching physical-oriented tasks e.g. laying tiles, changing fluorescent bulb. In addition to competency check, need to develop skills of dependability—following orders, being on time.	In either classification and discrimination tasks, be sure that the items are either discrete and/or the dimensions to be noted are either graphically or verbally specified. Cartoon character(s) might be used to increase attention and motivation.
ponses:	Will have difficulty with expressive language. Will use only 1/2 as many words in sentences (written). Will have higher response level to directions if response called for relating what they heard to the visual form (words, pictures) already produced.	Provide reminder for student to check tone and rate of speech (loud-soft, too fast-too slow). Provide opportunities for "question and answer" periods. Written responses: use paper with widely spaced lines; provide cues to have the student use manuscript and space between words.		To gain accurate knowledge of process: have student either write or recite process sequence; read written process sequence; and analyze what was wrong. Immediate comprehension favors a visual presentation; long term comprehension favors an auditory presentation.
forcement terms:	Supportive verbal comments > tangible reinforcements. Use fading technique-provide cues-success-fading external cues. Use right-wrong feedback form.		Build in primary reinforcement of success and mastery of materials.	
ICAL WORDS				
sentations:	If serial learning (just list of words) present simultaneously. If paired (word-picture) present material a little at a time.	Teach sight words utilizing kinesthetic and tactile senses e.g. use as much touch and experience. In defining terms and/or describing objects, use tactile terminology (smooth, hard, cold) not visual (shiny, light).	To increase comprehension (for males) use verbal over written . instruction. To increase comprehension (for females) use written over verbal instruction	Teach new words in context.
ent:	Learned 5 new sight words in hour using programmed sentences (7 average).		Might want to investigate use of taping to increase vocabulary and reading comprehension.	Words which are essential to the subject should be identified and concepts clarified prior to the need to read them.
tions	Extra practice sessions and/or intensified cues must be provided if new words have familiar configuration e.g. floor (flower, or flour).			Emphasize correspondence and accuracy of sounds produced by student.

APPENDIX F

REVISION RECOMMENDATIONS
LEARNING STRATEGIES PROJECT

PROG ____________________ INSTRUCTOR: ______________

UNIT: ____________ MOD #: ______________ DATE: ____________

MODULE TITLE: ____

REVISIONS: (please indicate page number and changes necessary, e.g. changes in information, job steps, illustrations)

____

____

____

____

____

____

APPENDIX G

MULTIPLE LEARNING STRATEGIES PROJECT
CAPITAL AREA CAREER CENTER
MASON, MICHIGAN

MODULE CHECKLIST

1. Writer
2. Jack edit _____ Second edit _____ Jack edit _____
   Alan edit _____ Second edit _____ Alan edit _____
   Deb edit _____ Second edit _____ Deb edit _____
3. Sandy notified to pay writer _____ Attach cost estimate _____
4. Craig cost estimate _____
5. Sandy - artist contract _____
6. Doris - check off master _____
7. Typist _____ (date & initial)
8. Jack edit _____ Typist (corrections if necessary) _____ _____ _____
   Alan edit _____ Typist (corrections if necessary) _____ _____ _____
   Deb edit _____ Typist (corrections if necessary) _____ _____ _____
9. Craig receives art _____ Sandy notified to pay artist _____
10. Paste up _____
11. Myrtle - final check _____
12. Make Readies _____
13. Sandy file final copies _____

DATE:

GROUP:

MODULE #:

MODULE TITLE:

CLASS [illegible]

APPENDIX H: FIELD TEST DATA SHEET

MODULE NUMBER AND TITLE	Student Information																						Revisions	Field Tester Info:		
	Easy to read			Easy to under-stand			Steps easy to follow			Pic-tures			Enough infor-mation			Able to do			Module rating					Time	Ich. Obs.	[illegible]
	Y	S	N	Y	S	N	Y	S	N	Y	S	N	Y	S	N	Y	S	N	A	B	C	D				
[illegible]	x			x			x			x			x			x			x				3/29	[illegible]	[illegible]	
[illegible] 00 [illegible]	x			x			x			x			x			x			x				3/30	[illegible]	[illegible]	
[illegible]	x			x			x			x			x			x			x				3/30	[illegible]	[illegible]	
[illegible]	x			x			x			x			x			x			x				3/29	[illegible]	[illegible]	
[illegible]	x			x			x			x			x			x			x				3/29	[illegible]	[illegible]	
[illegible]	x			x			x			x			x			x			x				3/30	[illegible]	[illegible]	
[illegible]	x			x			x			x			x			x			x				3/[illegible]	[illegible]	[illegible]	
[illegible] 03 00AN [illegible]	x			x			x			x			x			x			x				3/30	[illegible]	[illegible] a job	
01 04 00IN [illegible]uring in a New [illegible]card	x			x			x			x			x			x			x				3/30	[illegible]	[illegible] a job	
01 04 00AN [illegible]ching a New [illegible]card	x			x			x			x			x			x			x				3/30	[illegible]	[illegible] a job	—
[illegible]5 00[illegible]				Y			X			X			Y			X			X				3/30	[illegible]	[illegible]	—

356C

356D

C reads 5th-6th grade reading level; comp. lower

NAME T[illegible] Island (1)

Student Information																Field Tester Information			
eps sy o llow		Pictures			Enough information			Able to do			Module rating				Revisions	Time	Beh. Obs.	Ask for help	Revisions or comments
S	N	Y	S	N	Y	S	N	Y	S	N	A	B	C	D					
		✓			✓			✓			✓				3/29	9:54-10:05 [illegible] min.	e. e. doing a job	—	listed equipment all.
		✓			✓			✓			✓				3/30	10:00-10:02 [illegible] min.	e. e. doing a job	—	
		✓			✓			✓			✓				3/30	[illegible] [illegible] min.	e. e. doing a job	—	written evaluation: [illegible].
		✓			✓			✓				✓			3/29	[illegible] [illegible] min.	e. e. doing a job	—	
		✓			✓			✓			✓				3/29	[illegible] [illegible] min.	e. e. doing a job	—	
		✓			✓			✓			✓				3/30	[illegible] [illegible] min.	e. e. doing a job	—	written evaluation [illegible] had to re[illegible] [illegible]
		✓			✓			✓			✓				3/30	[illegible] min.	e. e. doing a job	—	
		✓			✓			✓			✓				3/30	[illegible] [illegible] min.	e. e. doing a job	—	
		✓			✓			✓			✓				3/30	[illegible] [illegible] min.	e. e. doing a job	—	
		✓			✓			✓			✓				3/30	[illegible] [illegible] min.	e. e. doing a job	—	
		x			x			x			x				3/30	[illegible]		—	

①

APPENDIX I

SLIDE/TAPE

UNIT MODULE	EASY TO UNDERSTAND			PICTURES			ENOUGH INFORMATION			SLIDE/TAPE RATING				REVISIONS	SAFTEY RULES
	Y	S	N	Y	S	N	Y	S	N	A	B	C	D		
Floor machine		x		x				x			x			felt that the tape should go slower when naming the parts of the machine	1. Unplug the machine 2. Damp mop the floor after you are done 3. Identify the machine parts
Floor machine	x			x			x				x			felt that the tape was too fast – " the tape talker would slow down his pace."	1. make sure the floor machine is fully charged 2. Plug machine in 3. Make sure the vacuum is going when solution is on, 4. Make sure the terminal post on battery is clean when recharging
Floor machine		x		x			x			x				felt that need to explain more about the machine	1. Check brake, spray Attachment + H_2O; Check battery and if need to scrape material off it 2. Do not use too much H_2O; damp mop; 3. Check Hoses 4. Do not forget to unplug machine

①

SLIDE/TAPE

UNIT MODULE	EASY TO UNDERSTAND			PICTURES			ENOUGH INFORMATION			SLIDE/TAPE RATING				REVISIONS	SAFTEY RULES
	Y	S	N	Y	S	N	Y	S	N	A	B	C	D		
Floor Machine	x			x			x				x			student felt that needed more information + more pictures. need info on checking where solution goes, making sure you know how to run machine	1. check battery 2. unplug cord
Floor machine	x			x			x			x				if had more pictures	do not go fast on the floor machine
Floor machine	x			x					x	x					1. move machine 2. vacuum outside first 3. unplug charger

③

SLIDE/TAPE

UNIT MODULE	EASY TO UNDERSTAND			PICTURES			ENOUGH INFORMATION			SLIDE/TAPE RATING				REVISIONS	SAFTEY RULES
	Y	S	N	Y	S	N	Y	S	N	A	B	C	D		
Floor machine			x	x					x	x				the tape goes too fast	never hit doors
Floor machine	x			x			x			x					make sure the master switch is off; plug it in and the flip master-on.

Name: ______________________

Date: ______________________

APPENDIX J

STUDENT EVALUATION - FIELD TESTER

Unit # ______________

Module ______________________ Program ______________________

1. What handicap category is the student ? ______________________

2. Time module was begun: __________ Finished: ______________

3. If module was not completed, what percentage was finished in what length of time? ______________________

4. What parts of the module required repeating? ______________________

____

Why? ______________________

5. Behavioral Observations: Check behaviors observed
    a. Boredom ________
    b. Frustration ________
    c. Confusion ________
    d. Disinterest or indifference ________
    e. Interested or motivated ________
    f. Other: Please describe ______________________

____

6. How frequently did the student ask for help
    a. with reading ________
    b. understanding the instructions ________
    c. with following the steps ________
    d. with performing the skill ________
    e. other: Please describe ______________________

____

7. What revisions would you recommend? ______________________

____

MLSP

Job Analysis Reporting Form Appendix K Date: ___

Name of Firm: ___

Address: ___

Department: ___

Job Title: ___ ___ Job No. (if any) ___

Job Duties: ___

___

___

DIRECTIONS: Mark an "X" in the box at the left hand side of the page if the activity is required in the performance of the job you are analyzing.

Leave the box blank if the activity [illegible] not required by the job.

Note: Some of the items are open to different interpretations. Words such as significant or considerable should be understood in their common useage.

WORKING POSITIONS — Mark the position(s) required on this job.

1. ☐ Stand independently, keeping balance without holding on or being held i.e. cutting hair, cooking, directing traffic.
   On this job one must stand:
   ___ 100% of the time
   ___ 75% of the time or more
   ___ 50% of the time or more
   ___ 25% of the time or more
   ___ 5% of the time or more
   ___ Less than 5% of the time

2. ☐ Sit, on chair, bench, stool, floor or in machinery, keeping balance without holding on or being held i.e. typing, driving a truck.
   On this job one must sit:
   ___ 100% of the time
   ___ 75% of the time or more
   ___ 50% of the time or more
   ___ 25% of the time or more
   ___ 5% of the time or more
   ___ Less than 5% of the time

3. ☐ Work lying on back or front i.e. auto mechanic working under a car, get at pipes under sink.
   On this job one must work lying down:
   ___ 100% of the time
   ___ 75% of the time or more
   ___ 50% of the time or more
   ___ 25% of the time or more
   ___ 5% of the time or more
   ___ Less than 5% of the time

☐ Work bending or leaning over, keeping balance without holding on or being held i.e. drafting, tuning a car.
   On this job one must work bending over:
   ___ Occasionally
   ___ Frequently

5. ☐ Kneel or crouch, and keep balance without using hands i.e. put air in auto tires, fitting shoes.
On this job one must kneel or crouch:
___ Occasionally
___ Frequently

6. ☐ Crawl: move about on hands and knees i.e. work in low area like crawl space under house (electrician, plumber).
On this job one must crawl:
___ Occasionally
___ Frequently

7. ☐ Use total body movements to push an object i.e. push a stalled car, push wheelchair.
On this job one must push:
___ Occasionally
___ Frequently

8. ☐ Use total body movements to pull an object i.e. pull a boat into a dock, pull cart.
On this job one must pull:
___ Occasionally
___ Frequently

MOBILITY — Mark the type(s) of mobility required by this job.

9. ☐ Walking is required. Specify frequency and distance.

Frequency: On this job one would walk:
___ Frequently (more than 2 1/2 hours per day) i.e. waiting on tables.
___ Average frequency (more than 1/2 hour per day) i.e. teacher.
___ Infrequently (less than 1/2 hour per day) i.e. typist.

Distance: On this job one would walk:
___ Long distances (greater than 100 yards at one time) i.e. delivering mail.
___ Average distances (greater than 10 yards at one time) i.e. salesperson in department store.
___ Short distances (less than 10 yards at one time) i.e. working cash register.

10. ☐ Keeping balance while walking on an irregular surface i.e. slanted (ramps), uneven (outdoors), slippery (ice or snow), or moving (escalator) surface.
Specify type(s) or surface(s) ______________.

11. ☐ Keeping balance while walking on narrow walk area or confined space (12" wide) without disturbing objects on either side i.e. walk across girders of building under construction, walk between close shelves, as in a wine cellar.

12. ☐ Climbing is required.
On this job one would have to:
___ Climb up and down standard stairs.
___ Climb up and down ladder.
___ Climb up and down scaffolding, poles, ropes, etc.

13. ☐ Carry objects, in hands, arms or on back or shoulders i.e. carry objects in bag, purse or back pack (mailman).
One would carry objects:
___ 3 yards or less
___ up to 10 yards
___ up to 50 yards
___ up to 100 yards
___ more

Maximum weight one would have to carry:

___ 5 lbs.
___ 10 lbs.
___ 25 lbs.
___ 50 lbs.
___ 100 lbs.
___ more

14. ☐ Balancing objects while carrying them in one's hands or arms i.e. carrying a tray of dishes, stack of papers, cup of coffee.

LIFTING — Mark the type(s) of lifting required on this job.

15. ☐ Lift objects from floor i.e. lift stretcher, luggage.
Maximum weight one would have to lift:
___ 5 lbs.
___ 10 lbs.
___ 25 lbs.
___ 50 lbs.
___ 100 lbs.
___ more

16. ☐ Lift and move (not slide) objects horizontally (across) at work level i.e. bench work on small engine, wash dishes.
Maximum weight one would have to lift:
___ 5 lbs.
___ 10 lbs.
___ 25 lbs.
___ 50 lbs.
___ 100 lbs.
___ more

17. ☐ Lift objects above shoulders i.e. paint ceiling, put dishes on high shelf.
Maximum weight one would have to lift:
___ 5 lbs.
___ 10 lbs.
___ 25 lbs.
___ 50 lbs.
___ 100 lbs.
___ more

ARM USE — Mark the type(s) of arm use required on this job.

18. ☐ Reach out, up to an arms length, and work with arms. Mark direction(s) one would have to reach:
___ up i.e. reach for high cupboard
___ down i.e. use low electric outlet
___ to the side i.e. collating papers
___ forward i.e. writing on blackboards
___ behind i.e. tying apron

19. ☐ Work with arms held out in space, not resting on anything, for a minute or longer i.e. hang wallpaper, write on blackboard, cut hair.

20. ☐ Bring hands toward body by bending arm at elbow i.e. eating, using hand saw.

21. ☐ Turn hand and forearm half way around i.e. turn a key, turn a screwdriver.

22. ☐ Turn whole arm all the way i.e. turn a large crank, work a manual mimeograph machine.

HAND USE — Mark the type(s) of hand use required on this job.

23. ☐ Grasp and hold large object with whole hand i.e. holding a book, hammer, baseball.

24. ☐ Grasp and hold small object between thumb and fingers i.e. holding pins, small nuts and bolts.

25. ☐ Manipulate objects: pick up, pinch, squeeze, handle i.e. assemble small parts, hand sewing, wind a watch.

26. ☐ Detect size, shape, texture, and/or position of objects by touch alone i.e. find rough areas to be sanded on woodworking, find blood vessel in arm.

27. ☐ Detect temperature, pressure and pain by touch alone i.e. tell if machine is overheating, read pulse.

NON-AMBULATORY LEG USE: the use of the legs and feet for activities other than walking — Mark the type(s) of leg use required on this job.

28. ☐ Depress and release leg controls, or any activity requiring motion of whole leg i.e. use a treadle, truck clutch.

29. ☐ Depress and release foot controls, or any activity requiring motion of just ankle and foot i.e. accelerator of car, foot control on sewing machine.

30. ☐ Push with considerable force on object or mechanism with leg(s) i.e. stop truck with standard brake, lift heavy object by straightening legs (not back).

31. ☐ Detect and react to variations in pressure as felt through feet or legs i.e. use clutch, control speed of sewing machine through foot pedal.

COORDINATION: the use of two or more parts of the body together to perform a complex task smoothly — Mark the type(s) of coordination required on this job.

32. ☐ Use smooth, coordinated motion of whole arm for large scale actions which must be coordinated for accuracy or safety i.e. cut curved line with power jig saw, write on blackboard.

33. ☐ Use smooth, coordinated motion of wrist, hand and fingers for small scale actions which must be co-ordinated for accuracy or safety i.e. watch repair, hand sewing, diamond cutting.

34. ☐ Coordinated use of two or more limbs at the same time i.e. play piano, drive car, use multi-harness loom.
Mark which limbs would be used at the same time on this job:

___ Both arms
___ Arm(s) and leg(s) together
___ Both legs

35. ☐ Use limbs quickly without loss of accuracy i.e. typing, take dictation. Mark only if speed is necessary for this job.

36. ☐ Coordinated use of hand(s), with what is seen i.e. focus microscope, thread needle.

37. ☐ Coordinated use of leg(s) with what is seen i.e. step on bug, walk on ceiling joists during home construction.

38. ☐ Know where your arm(s) or leg(s) is and how it is moving, without seeing it i.e. working around any machinery with exposed moving parts (printing press), type without watching fingers.

VISION — Mark the type(s) of visual abilities required by this job.

39. Accurate vision at close range (20 inches or less) i.e. inspecting and sorting.

40. ☐ Accurate vision at medium range (20 inches to 20 feet) i.e. read blackboard, watch television.

41. ☐ Accurate vision at long range (20 feet or more) i.e. see across room, use transit for surveying.

42. ☐ Tell position and distance of objects through sight alone (Depth Perception) i.e. safe working around moving machinery, cross street.

43. ☐ See an object which is not in the direct line of vision (Peripheral Vision) i.e. working around moving machinery, walking across busy street.

44. ☐ Ability of the eye to adjust to seeing objects at different distances (Accomodation) i.e. copy off of blackboard, compare printed copy to original.

45. ☐ Identify and differentiate colors i.e. use color coded wiring in electronics, use color coded filing system.

46. ☐ Detect and differentiate tastes and odors i.e. seasoning foods in cooking, identifying chemical. Mark only if it is necessary for this job.

COMMUNICATION SKILLS — Mark the type(s) of communication skills required by this job.

47. ☐ Hear various sounds and differentiate between them i.e. warning bell, machinery rattle, speech.

48. ☐ Talk: includes ability to understand spoken words as well as use intelligible speech at normal conversational level i.e. retail selling, teaching.

49. ☐ Talk, above background noise: includes selective listening and understanding of speech and loud speaking i.e. talk in loud factory, print shop.

50. ☐ Use telephone: includes hearing and understanding what is said and using speech which is able to be understood over the telephone.

51. ☐ Communicate through written words: includes reading and writing i.e. proofread, edit, use auto manuals.

52. ☐ Communicate through diagrams: includes reading and recording information on graphs, charts, blue prints, forms, etc., i.e. construction work, drafting, composing, using auto manuals.

WORKING CONDITIONS — Mark the type(s) of working conditions which are essential to do this job.

53. ☐ Inside: protection from weather, but not necessarily from temperature changes. Worker is inside 75% of the time or more i.e. teacher, secretary.

54. ☐ Outside: no effective protection from weather. Worker is outside 75% of the time or more i.e. groundskeeper, construction worker.

55. ☐ Both inside and outside in approximately equal amounts i.e. policeman, fireman.

56. ☐ Temperature sufficiently low or high to cause marked bodily discomfort i.e. meat cutter, foundry plant worker.
Mark temperature:
___ Hot
___ Cold
___ Both

57. ☐ Temperature changes which are sufficiently marked and abrupt to cause noticeable body reactions i.e. fireman, waitress going from hot kitchen to air conditioned dining room.

58. ☐ Frequent (over 33% of the time) or long (over 1 hour) contact with water or other liquids i.e. underwater welder, dishwasher.

59. ☐ Humidity high enough to cause discomfort i.e. greenhouse worker, laundry presser.

60. ☐ Very dry atmosphere, enough to cause discomfort i.e. bakery worker, concrete plant worker.

61. ☐ Atmospheric conditions which effect the respiratory system or the skin.
Mark the atmospheric conditions found on this job:
___ Fumes: smoky or vaporous exhaust i.e. auto exhaust fumes.
___ Odors: noxious smells i.e. ammonia.
___ Dusts: solid particles suspended in the air i.e. flour.
___ Mists: liquid particles suspended in the air i.e. spray paint.
___ Poor Ventiliation: insufficient movement of air i.e. air conditioning installer.

62. ☐ Enough noise, constant or intermittent, to cause distraction or possible injury to sense of hearing i.e. foundry worker, arc welder.

63. ☐ Sufficient vibration or strain on the body of its extremities from repeated motion or shock to cause bodily harm if endured day after day i.e. pneumatic hammer operator, chain saw operator.

64. ☐ Hazards: situations where the worker is exposed to definite risk of bodily injury i.e. policeman, fireman.

Please explain: ______________________________

____

65. ☐ Work alone: perform tasks by self, isolated from others i.e. forestry conservation officer, trapper.

66. ☐ Share tools, environment or equipment with others, but perform tasks by self i.e. secretary, assembly line worker.

67. ☐ Work with others on common task i.e. surgeon, cast in a play.

68. Work schedule: mark the type(s) of working schedule required by this job.

___ Full time
___ Part time
___ Overtime required occasionally
___ Overtime required frequently

NAME ____________________________

DATE ____________________________

APPENDIX L

SLIDE/TAPE EVALUATION - 1

UNIT: ____________ MODULE: ______________________ PROGRAM: ____________________

	YES	SOMETIMES	NO
1. THIS SLIDE/TAPE IS EASY TO UNDERSTAND.	________	________	________
2. THE PICTURES ARE HELPFUL.	________	________	________
3. THE SLIDE/TAPE HAS ENOUGH INFORMATION SO THAT I CAN PERFORM THE SKILL.	________	________	________

4. THE SLIDE/TAPE COULD BE BETTER IF ____________________________

____

____

5. THE SAFETY RULES ARE ____________________________________

____

____

____

6. THIS SLIDE/TAPE IS:

   A. VERY GOOD ☐
   B. GOOD ☐
   C. FAIR ☐
   D. POOR ☐

MULTIPLE LEARNING STRATEGIES PROJECT
CAPITAL AREA CAREER CENTER
MASON, MICHIGAN

APPENDIX M: JOB ANALYSIS INTERPRETATION GUIDE

Interpretation Guide

J.A.C.C. - Jackson Area Career Center
C.A.C.C. - Capital Area Career Center
OJA-J - On the Job Analysis - Jackson
OTA-L - On the Job Analysis - Lansing

The career area analyzed in this instance was Small Engine Repair person. Two hour observations were done at both Career Centers and at businesses in and around both communities. The percentages reflect the number of times an item was marked at the given analysis site during the observational period.

	C.A.C.C.	J.A.C.C.	REASONS FOR DISCREPANCIES.
1. STAND	100%	100%	
2. SIT	0%	100%	Setting differences & availability of equipment
3. LAY	0%	0%	
4. BEND	100%	100%	
FREQUENCY			
5. KNEEL OR CROUCH	100%	100%	
FREQUENCY			
6. CRAWL	0%	0%	
FREQUENCY			
7. PUSH	100%	100%	
FREQUENCY			
8. PULL	100%	100%	
FREQUENCY			
9. WALKING	100%	100%	
FREQUENCY			
DISTANCE			
10. BALANCE - SURFACE	100%	50%	Setting differences
11. BALANCE - SPACE	0%	0%	
12. CLIMBING			
A) STAIRS	0%	0%	
B) LADDERS			
C) OTHER			
13. CARRY	100%	100%	
WEIGHT			
DISTANCE			
14. CARRY&BALANCE	0%	0%	
15. LIFT FROM FLOOR	100%	100%	
WEIGHT			
16. LIFT HORIZ.	100%	100%	
WEIGHT			
17. LIFT ABOVE SHOULDERS	33%	0%	Location of available equip.
WEIGHT			
18. REACH	100%	100%	
A) UP			
B) DOWN	100%	100%	
C) RIGHT	100%	100%	
D) LEFT	100%	100%	
E) FORWARD	100%	100%	
F) BEHIND	0%	0%	
19. ARMS IN SPACE	33%	50%	Observed task differences
20. BEND ELBOW	100%	100%	
21. HALF TURN	100%	100%	
22. WHOLE TURN	67%	100%	Task differences & Equip. difs.
23. LARGE GRASP	100%	100%	
24. SMALL GRASP	100%	100%	
25. MANIPULATE	100%	100%	
26. LIGHT TOUCH	0%	100%	Observed task differences
27. DEEP TOUCH	0%	50%	as above

	C.A.C.C.	J.A.C.C.	REASONS FOR DISCREPANCIES
28. LEG USE	33%	100%	Observed task differences
29. FOOT USE	0%	50%	as above
30. APPLY FORCE	67%	100%	as above
31. LEG TOUCH	33%	100%	as above
32. LARGE COORD. MOTIONS	67%	100%	as above
33. SMALL COORD. MOTIONS	100%	100%	
34. BILATERAL COORDINATION			
A) BOTH ARMS	33%	100%	Observed task differences
B) ARM(S)	33%	50%	as above
C) BOTH LEGS	0%	0%	
D) LEG(S)	0%	0%	
E) TOGETHER	0%	0%	
35. SPEED			
A) HAND(S)	33%	0%	Observed task differences
B) ARM(S)	33%	0%	as above
C) FEET	0%	0%	
D) LEG(S)	0%	0%	
36. EYE-HAND	100%	100%	
37. EYE-FOOT	33%	33%	
38. NON-VISUAL	0%	100%	Observed task differences
39. CLOSE VISION	100%	100%	
40. MEDIUM VISION	67%	50%	Setting & task differences
41. FAR VISION	0%	0%	
42. DEPTH PERCEPTION	0%	100%	Observed task differences
43. PERIPHERAL VISION	33%	0%	as above
44. ACCOMODATION	0%	100%	as above & setting
45. COLOR VISION	67%	0%	Observed task differences
46. DETECT ODORS	67%	0%	Setting differences
47. HEAR	100%	100%	
48. TALK	100%	100%	
49. TALK ABOVE NOISE	100%	100%	
50. PHONE USE	33%	0%	Availability of equip.
51. READ & WRITE	100%	100%	
52. READ DIAGRAMS	100%	100%	
53. WORK INSIDE	100%	100%	
54. WORK OUTSIDE	0%	0%	
55. WORK INSIDE & OUTSIDE	0%	0%	
56. HIGH OR LOW TEMP.			
A) HIGH	0%	0%	
B) LOW	0%	0%	
C) BOTH	0%	0%	
57. TEMP. CHANGES	0%	0%	
58. CONTACT W/ LIQUIDS	0%	0%	
59. HIGH HUMIDITY	0%	0%	
60. LOW HUMIDITY (DRY)	0%	0%	

	C.A.C.C.	J.A.C.C.	REASONS FOR DISCREPANCIES
61. ATMOSPHERIC CONDITIONS			
A) FUMES	100%	50%	Observed task & setting difs.
B) ODORS	100%	100%	
C) DUST	33%	33%	
D) MIST	0%	0%	
E) POOR VENT.	0%	0%	
62. NOISE	100%	100%	
63. VIBRATION	33%	0%	Observed task differences
64. HAZARDS	67%	0%	as above
65. MUST WORK ALONE	0%	100%	Observed tasks & setting difs
66. SHARE TOOLS ETC.	67%	100%	as above
67. WORK TOGETHER	67%	100%	as above
68. WORK SCHEDULE			
A) FULL TIME	0%	0%	
B) PART TIME	100%	100%	
C) O.T. OCCASIONALLY	0%	0%	
D) O.T. FREQUENTLY	0%	0%	

	J.A.C.C.	OJA-J	REASONS FOR DISCREPANCIES
1. STAND	100%	100%	
2. SIT	100%	25%	C.C.setting vs. OTJ setting
3. LAY	0%	0%	
4. BEND	100%	100%	
FREQUENCY			
5. KNEEL OR CROUCH	100%	100%	
FREQUENCY			
6. CRAWL	0%	0%	
FREQUENCY			
7. PUSH	100%	100%	
FREQUENCY			
8. PULL	100%	75%	OTJ tasks observed vs. C.C. tasks observed
FREQUENCY			
9. WALKING	100%	100%	
FREQUENCY			
DISTANCE			
10. BALANCE - SURFACE	50%	25%	C.C. setting vs. OTJ setting
11. BALANCE - SPACE	0%	0%	
12. CLIMBING			
A) STAIRS	0%	0%	
B) LADDERS			
C) OTHER			
13. CARRY	100%	100%	
WEIGHT			
DISTANCE			
14. CARRY&BALANCE	0%	25%	Available equip.C.C. vs. OTJ
15. LIFT FROM FLOOR	100%	100%	
WEIGHT			
16. LIFT HORIZ.	100%	100%	
WEIGHT			
17. LIFT ABOVE SHOULDERS	0%	50%	Location & availability of equip. for tasks: C.C. vs. OTJ
WEIGHT			
18. REACH			
A) UP	100%	50%	
B) DOWN	100%	75%	Location of equip. C.C. vs. OTJ
C) RIGHT	100%	100%	
D) LEFT	100%	100%	
E) FORWARD	100%	100%	
F) BEHIND	0%	0%	
19. ARMS IN SPACE	50%	25%	OTJ tasks observed vs. C.C. tasks
20. BEND ELBOW	100%	100%	
21. HALF TURN	100%	100%	
22. WHOLE TURN	100%	100%	
23. LARGE GRASP	100%	100%	
24. SMALL GRASP	100%	100%	
25. MANIPULATE	100%	100%	
26. LIGHT TOUCH	100%	75%	OTJ tasks observed vs. C.C. tasks
27. DEEP TOUCH	50%	75%	observed

	J.A.C.C.	OJA-J	REASONS FOR DISCREPANCIES
28. LEG USE	100%	75%	OTJ tasks observed vs. C.C. ta
29. FOOT USE	50%	25%	observed
30. APPLY FORCE	100%	50%	Available equip. & as above
31. LEG TOUCH	100%	50%	OTJ tasks observed vs. C.C. ta
32. LARGE COORD. MOTIONS	100%	100%	
33. SMALL COORD. MOTIONS	100%	100%	
34. BILATERAL COORDINATION			
A) BOTH ARMS	100%	75%	OTJ tasks observed vs. C.C. tas
B) ARM(S)	50%	25%	observed
C) BOTH LEGS	0%	25%	as above
D) LEG(S)	0%	0%	
E) TOGETHER	0%	25%	OTJ tasks observed vs. C.C. tas
35. SPEED			
A) HAND(S)	0%	0%	
B) ARM(S)	0%	0%	
C) FEET	0%	0%	
D) LEG(S)	0%	0%	
36. EYE-HAND	100%	100%	
37. EYE-FOOT	33%	25%	Available equip. C.C. vs. OTJ
38. NON-VISUAL	100%	100%	
39. CLOSE VISION	100%	100%	
40. MEDIUM VISION	50%	100%	C.C. setting vs. OTJ setting
41. FAR VISION	0%	0%	
42. DEPTH PERCEPTION	100%	100%	
43. PERIPHERAL VISION	0%	0%	
44. ACCOMODATION	100%	25%	C.C. tasks observed vs. OTJ tas
45. COLOR VISION	0%	0%	
46. DETECT ODORS	0%	0%	
47. HEAR	100%	50%	C.C. tasks observed vs. OTJ tas
48. TALK	100%	100%	
49. TALK ABOVE NOISE	100%	25%	C.C. tasks observed vs. OTJ tas
50. PHONE USE	0%	50%	observed & availability of equi
51. READ & WRITE	100%	100%	
52. READ DIAGRAMS	100%	50%	C.C. tasks observed vs. OTJ tas
53. WORK INSIDE	100%	100%	
54. WORK OUTSIDE	0%	0%	
55. WORK INSIDE & OUTSIDE	0%	0%	
56. HIGH OR LOW TEMP.			
A) HIGH	0%	0%	
B) LOW	0%	25%	C.C. setting vs. OTJ setting
C) BOTH	0%	0%	
57. TEMP. CHANGES	0%	0%	
58. CONTACT W/ LIQUIDS	0%	0%	
59. HIGH HUMIDITY	0%	0%	
60. LOW HUMIDITY (DRY)	0%	0%	

	J.A.C.C.	OJA-J	REASONS FOR DISCREPANCIES
61. ATMOSPHERIC CONDITIONS			
A) FUMES	50%	75%	C.C. setting vs. OTJ setting
B) ODORS	100%	0%	as above
C) DUST	33%	100%	as above
D) MIST	0%	0%	
E) POOR VENT.	0%	50%	C.C. setting vs. OTJ setting
62. NOISE	100%	100%	
63. VIBRATION	0%	0%	
64. HAZARDS	0%	25%	C.C. tasks observed vs. OTJ tas
65. MUST WORK ALONE	100%	0%	as above & Availability of equi
66. SHARE TOOLS ETC.	100%	100%	
67. WORK TOGETHER	100%	0%	C.C. tasks observed vs. OTJ tas
68. WORK SCHEDULE			
A) FULL TIME	0%	100%	C.C. setting vs. OTJ setting
B) PART TIME	100%	0%	as above
C) O.T. OCCASIONALLY	0%	25%	as above
D) O.T. FREQUENTLY	0%	0%	

	OJA-L	OJA-J	REASONS FOR DISCREPANCIES
1. STAND	100%	100%	
%			
2. SIT	75%	25%	Setting differences
%			
3. LAY	25%	0%	Observed job task differences
%			
4. BEND	100%	100%	
FREQUENCY			
5. KNEEL OR CROUCH	75%	100%	Observed job task differences
FREQUENCY			
6. CRAWL	0%	0%	
FREQUENCY			
7. PUSH	100%	100%	
FREQUENCY			
8. PULL	100%	75%	Availability of equip. & observed job task differences
FREQUENCY			
9. WALKING	100%	100%	
FREQUENCY			
DISTANCE			
10. BALANCE - SURFACE	100%	25%	Setting differences
11. BALANCE - SPACE	0%	0%	
12. CLIMBING			
A) STAIRS	0%	0%	
B) LADDERS			
C) OTHER			
13. CARRY	100%	100%	
WEIGHT			
DISTANCE			
14. CARRY&BALANCE	0%	25%	Observed job task differences
15. LIFT FROM FLOOR	100%	100%	
WEIGHT			
16. LIFT HORIZ.	100%	100%	
WEIGHT			
17. LIFT ABOVE SHOULDER	25%	50%	Location and availability of equip.
WEIGHT			
18. REACH	100%	50%	
A) UP			Location and availability of equip.
B) DOWN	100%	75%	as above & observed job task difs.
C) RIGHT	100%	100%	
D) LEFT	100%	100%	
E) FORWARD	100%	100%	
F) BEHIND	0%	0%	
19. ARMS IN SPACE	25%	25%	
20. BEND ELBOW	100%	100%	
21. HALF TURN	100%	100%	
22. WHOLE TURN	100%	100%	
23. LARGE GRASP	100%	100%	
24. SMALL GRASP	100%	100%	
25. MANIPULATE	100%	100%	
26. LIGHT TOUCH	0%	75%	Observed job task differences
27. DEEP TOUCH	0%	75%	as above

	OJA-L	OJA-J	REASONS FOR DISCREPANCIES
28. LEG USE	50%	75%	Observed job task differences
29. FOOT USE	50%	25%	as above & availability of equip.
30. APPLY FORCE	50%	50%	
31. LEG TOUCH	75%	50%	Observed job task differences & availability of equipment
32. LARGE COORD. MOTIONS	25%	100%	
33. SMALL COORD. MOTIONS	100%	100%	
34. BILATERAL COORDINATION			
A) BOTH ARMS	25%	75%	Observed job task differences
B) ARM(S)	25%	25%	
C) BOTH LEGS	0%	25%	Observed job task differences
D) LEG(S)	0%	0%	
E) TOGETHER	0%	25%	Observed job task differences
35. SPEED			
A) HAND(S)	25%	0%	Observed job task differences
B) ARM(S)	25%	0%	as above
C) FEET	0%	0%	
D) LEG(S)	0%	0%	
36. EYE-HAND	100%	100%	
37. EYE-FOOT	33%	25%	Availability of equipment & Observed job task differences
38. NON-VISUAL	0%	100%	
39. CLOSE VISION	100%	100%	
40. MEDIUM VISION	100%	100%	
41. FAR VISION	0%	0%	
42. DEPTH PERCEPTION	25%	100%	Observed job task differences
43. PERIPHERAL VISION	75%	0%	as above
44. ACCOMODATION	0%	25%	as above
45. COLOR VISION	50%	0%	as above
46. DETECT ODORS	0%	0%	
47. HEAR	100%	50%	Observed job task differences
48. TALK	100%	100%	
49. TALK ABOVE NOISE	100%	25%	Setting & observed job task difs.
50. PHONE USE	75%	50%	as above & availability of equip.
51. READ & WRITE	100%	100%	
52. READ DIAGRAMS	50%	50%	
53. WORK INSIDE	100%	100%	
54. WORK OUTSIDE	0%	0%	
55. WORK INSIDE & OUTSIDE	0%	0%	
56. HIGH OR LOW TEMP.			
A) HIGH	0%	0%	
B) LOW	25%	25%	
C) BOTH	0%	0%	
57. TEMP. CHANGES	25%	0%	Setting differences.
58. CONTACT W/ LIQUIDS	0%	0%	
59. HIGH HUMIDITY	0%	0%	
60. LOW HUMIDITY (DRY)	0%	0%	

	OJA-L	OJA-J	REASONS FOR DISCREPANCIES
61. ATMOSPHERIC CONDITIONS			
A) FUMES	100%	75%	Setting & availability of equip.
B) ODORS	100%	0%	as above & job task differences
C) DUST	25%	100%	as above
D) MIST	0%	0%	
E) POOR VENT.	50%	50%	
62. NOISE	100%	100%	
63. VIBRATION	25%	0%	Observed job task differences
64. HAZARDS	75%	25%	as above & setting differences
65. MUST WORK ALONE	0%	0%	
66. SHARE TOOLS ETC.	100%	100%	
67. WORK TOGETHER	0%	0%	
68. WORK SCHEDULE			
A) FULL TIME	100%	100%	
B) PART TIME	0%	0%	
C) O.T. OCCASIONALLY	0%	25%	Setting differences
D) O.T. FREQUENTLY	0%	0%	

	C.A.C.C.	OJA-L	REASONS FOR DISCREPANCIES
1. STAND	100%	100%	
%			
2. SIT	0%	75%	C.C. setting vs. OTJ setting
%			
3. LAY	0%	25%	C.C. tasks observed vs. OTJ task observed
%			
4. BEND	100%	100%	
FREQUENCY			
5. KNEEL OR CROUCH	100%	75%	C.C. tasks observed vs. OTJ task observed
FREQUENCY			
6. CRAWL	0%	0%	
FREQUENCY			
7. PUSH	100%	100%	
FREQUENCY			
8. PULL	100%	100%	
FREQUENCY			
9. WALKING	100%	100%	
FREQUENCY			
DISTANCE			
10. BALANCE - SURFACE	100%	100%	
11. BALANCE - SPACE	0%	0%	
12. CLIMBING			
A) STAIRS	0%	0%	
B) LADDERS			
C) OTHER			
13. CARRY	100%	100%	
WEIGHT			
DISTANCE			
14. CARRY&BALANCE	0%	0%	
15. LIFT FROM FLOOR	100%	100%	
WEIGHT			
16. LIFT HORIZ.	100%	100%	
WEIGHT			
17. LIFT ABOVE SHOULDERS	33%	25%	Location & availability of equip. for tasks: C.C. vs. OTJ
WEIGHT			
18. REACH			
A) UP	100%	100%	
B) DOWN	100%	100%	
C) RIGHT	100%	100%	
D) LEFT	100%	100%	
E) FORWARD	100%	100%	
F) BEHIND	0%	0%	
19. ARMS IN SPACE	33%	25%	C.C. tasks observed vs. OTJ tasks
20. BEND ELBOW	100%	100%	
21. HALF TURN	100%	100%	
22. WHOLE TURN	67%	100%	as above & Availability of equip.
23. LARGE GRASP	100%	100%	
24. SMALL GRASP	100%	100%	
25. MANIPULATE	100%	100%	
26. LIGHT TOUCH	0%	0%	
27. DEEP TOUCH	0%	0%	

	C.A.C.C.	OJA-L	REASONS FOR DISCREPANCIES
28. LEG USE	33%	50%	C.C. tasks observed vs. OTJ
29. FOOT USE	0%	50%	tasks observed
30. APPLY FORCE	67%	50%	as above
31. LEG TOUCH	33%	75%	as above & availability of eq
32. LARGE COORD. MOTIONS	67%	25%	as above
33. SMALL COORD. MOTIONS	100%	100%	
34. BILATERAL COORDINATION			
A) BOTH ARMS	33%	25%	C.C tasks observed vs. OTJ
B) ARM(S)	33%	25%	tasks observed
C) BOTH LEGS	0%	0%	
D) LEG(S)	0%	0%	
E) TOGETHER	0%	0%	
35. SPEED			
A) HAND(S)	33%	25%	C.C. tasks observed vs. OTJ
B) ARM(S)	33%	25%	tasks observed
C) FEET	0%	0%	
D) LEG(S)	0%	0%	
36. EYE-HAND	100%	100%	
37. EYE-FOOT	33%	33%	Availability of equip.
38. NON-VISUAL	0%	0%	
39. CLOSE VISION	100%	100%	
40. MEDIUM VISION	67%	100%	C.C. tasks observed vs. OTJ t
41. FAR VISION	0%	0%	
42. DEPTH PERCEPTION	0%	25%	C.C. tasks observed vs. OTJ ta
43. PERIPHERAL VISION	33%	75%	as above
44. ACCOMODATION	0%	0%	
45. COLOR VISION	67%	50%	C.C. tasks observed vs. OTJ ta
46. DETECT ODORS	67%	0%	C.C. setting vs. OTJ setting
47. HEAR	100%	100%	
48. TALK	100%	100%	
49. TALK ABOVE NOISE	100%	100%	
50. PHONE USE	33%	75%	Availability of equip.
51. READ & WRITE	100%	100%	
52. READ DIAGRAMS	100%	50%	C.C. tasks observed vs. OTJ ta
53. WORK INSIDE	100%	100%	
54. WORK OUTSIDE	0%	0%	
55. WORK INSIDE & OUTSIDE	0%	0%	
56. HIGH OR LOW TEMP.			
A) HIGH	0%	0%	
B) LOW	0%	25%	C.C. setting vs. OTJ setting
C) BOTH	0%	0%	
57. TEMP. CHANGES	0%	25%	C.C. tasks observed vs. OTJ ta
58. CONTACT W/ LIQUIDS	0%	0%	
59. HIGH HUMIDITY	0%	0%	
60. LOW HUMIDITY (DRY)	0%	0%	

	C.A.C.C.	OJA-L	REASONS FOR DISCREPANCIES
61. ATMOSPHERIC CONDITIONS			
A) FUMES	100%	100%	
B) ODORS	100%	100%	
C) DUST	33%	25%	C.C. setting vs. OTJ setting
D) MIST	0%	0%	
E) POOR VENT.	0%	50%	C.C. setting vs. OTJ setting
62. NOISE	100%	100%	
63. VIBRATION	33%	25%	C.C. tasks observed vs. OTJ tas
64. HAZARDS	67%	75%	as above
65. MUST WORK ALONE	0%	0%	
66. SHARE TOOLS ETC.	67%	100%	Availability of equip.
67. WORK TOGETHER	67%	0%	as above & setting differences
68. WORK SCHEDULE			
A) FULL TIME	0%	100%	C.C. setting vs. OTJ setting
B) PART TIME	100%	0%	as above
C) O.T. OCCASIONALLY	0%	0%	
D) O.T. FREQUENTLY	0%	0%	

APPENDIX N: SAMPLE COMPOSITE TASK

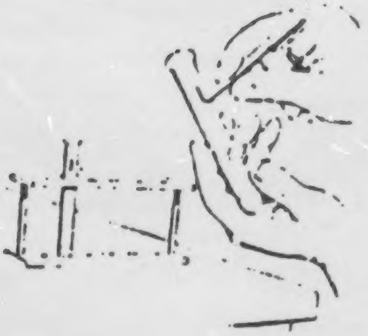
STUDENT DIRECTIONS
Saliva Activity Experiment

Collect the following equipment.

Set equipment at work area designated by teacher.

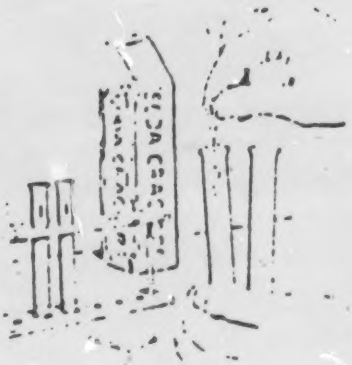
QUANTITY	ITEM	LOCATION (To be filled in by tester)
1	Rubberband	Upper right desk drawer
1	Graph paper, ½"	Upper right desk drawer
1	Pencil	Upper right desk drawer
1	Ruler	Upper right desk drawer
6	Test tubes	Glasswear cabinet
2	Beakers, 250 ml.	Glasswear cabinet
1	Test tube rack	2nd Cabinet, top shelf
1	Test tube holder	2nd Cabinet, top shelf
1	Test tube brush	2nd Cabinet, middle shelf
2	Eyedroppers	Glasswear cabinet
1	Marking pencil	Middle drawer of desk
1	Beaker holder	2nd Cabinet, top shelf
1	Soda cracker	Obtain from tester
1	Bottle of Iodine Solution	Obtain from tester
1	Bottle of Benedicts Solution	Obtain from tester
1	Electric hot plate	Bottom shelf, 2nd cabinet
1	Asbestos pad or trivet	Bottom shelf, 2nd cabinet

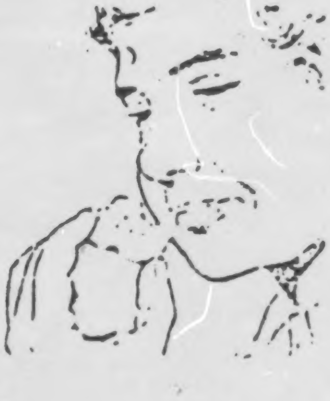
1. Rinse your mouth well. Then chew a rubber band and collect some saliva in a beaker.



2. Divide the saliva between two test tubes. Label both test tubes "1".

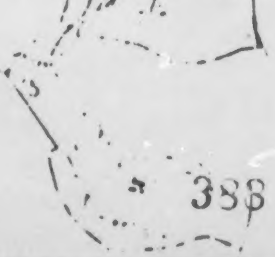
3. Break up half a cracker. Divide crums between two more test tubes. Lable them "2".

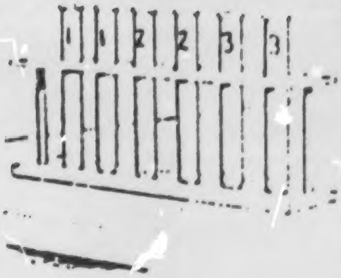




4. Chew the other half of the cracker well. Do not swallow it.

5. Collect the chewed up cracker in two clean test tubes. Label them "3".



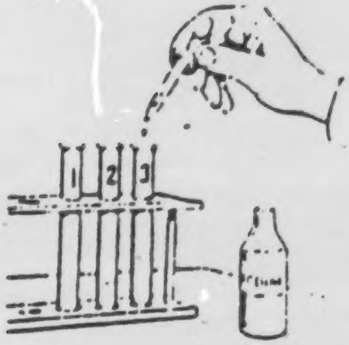


6. You now have three sets of test tubes

7. Using a pencil and ruler, prepare a table like this on the graph paper to record the results of your testing.

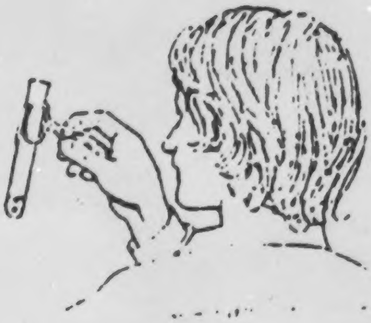
TESTS FOR STARCH AND SUGAR

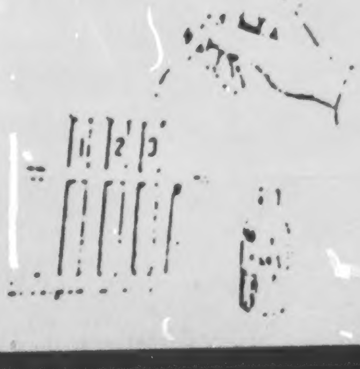
Number	Material Tested	Starch	Sugar
1	Saliva		
2	Cracker		
3	Chewed cracker		



8. To test for starch, place four drops of Iodine solution in one test tube from each set.

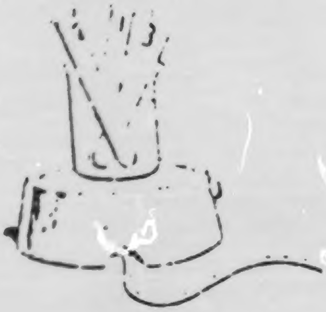
9. Watch for a color change. A blue color means there is starch present. Record the results on your table.

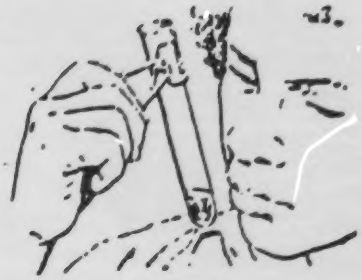




10. To test for sugar, place ten drops of Benedicts solution in each of the remaining test tubes.

11. Heat the solution in a water bath for three minutes. Use the watch to time it.





12. Remove the test tubes from the hot water with the test tube holder. Watch for a color change. A yellow,orange or red color indicates sugar. Record the results on your table.

13. Carefully remove the hot beaker from the hot plate and set it on the asbestos pad untill it is cool.

14. Empty all test tubes as directed by the tester. Wash them with warm water and a brush, using a twisting motion to clean the inside throughly. Set them upside down on the drying rack to dry.

15. Wash the beakers with warm water and dry them with paper towles.

16. Replace all equipment .

17. Hand in result sheet to tester.

SUBTASK #36 - DRAFT 2

PURPOSE: Assess approximate fine eye-hand coordination

E/M: Option I - Microscope, 3 sample plates, table/desk, chair.

Option II - Twenty inches of thread, one four-hole button one-half inch in diameter (shirt size).

DIRECTION: Option I - While the student is watching, mount one sample plate on the stage. Adjust the scope to it's lowest powered lense. Ask the student to observe the sample plate by looking through the eye-piece. Demonstrate the use of the coarse and fine adjustment knoles by bringing the sample plate into and out of focus. Remove the first sample plate from the stage. Mount a second sample plate on the stage under the clips.

Say to the student, "Some jobs require the worker to make adjustments on sensitive equipment or machines. Medical technologists, micro-biologists, and computer repair-persons often must make fine adjustments on the equipment they use in their work."

"Focus the microscope to clearly view the specimen on the sample plate by using the coarse and fine adjustment knobs. When you think you have the sample in focus, let me look."

When the student has focused the scope, observe the specimen. It should be in relatively clear focus, allowing for differences between the student visual acuity and your own. If the specimen is not in relatively clear focus, remove the second sample and replace it with the third. Bring the third specimen into focus. Turn the fine adjustment knob one full turn to blur the image.

Say to the student, "Using the fine adjustment knob, bring the sample into sharp focus."

Observe the student's second effort.

Option II - Say to the student, "Some jobs require the worker to assemble or make small items by hand. Jewelers, electronic repair-persons and assemblers often have to work on very small items."

Give the student the prepared illustrations for this subtask.

Say to the student, "Pick up the button with your left hand. Hold it by its edges between your thumb and forefinger as shown in the first illustration. Pick up the thread with your right hand and hold it between your thumb and forefinger as shown in the second illustration. Push the thread through one of the four holes. Pull about four inches of thread through the hole. Push the thread back through one of the other three holes. Pull about four inches of thread through. Push the thread through one of the remaining two holes. Pull about four inches of thread through. Push the thread through the last empty hole and pull about four inches through.

RECORD:

Option I: Note on the SPS if the student cannot successfully focus the microscope to the point where one of the samples can be clearly seen.

Option II: Note on the SPS if the student cannot successfully weave the thread through the four holes in the button.

APPENDIX OO

RESULTS

CLASS POHI (H. S.) Field Test I

DATE 6/7/77

COMPOSITE TASK	Comp. Task		#9		#23		#24		#25		#33		#40		#48		#51		#		#		#		#		#		#		#		#		#		#		#		#	
Employment Application I	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
		x	x		x		x		x		x		x		x			x																								

COMMENTS

This C. P. student suggested that the print on the application sheet be enlarged and darkened. The original sheet, poorly copied, contributed to this students enability to correctly supply the needed information.

REVISIONS

The application sheet has been re-typed with larger, darker print.

			#18		#19		#20		#21		#22		#23		#24		#25		#32		#33		#39		#40		#47		#48		#51		#52		#		#		#		#	
Dietetic Assistant	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	x		x		x		x		x		x		x		x		x		x		x		x		x		x		x		x		x									

COMMENTS

Although this student was able to complete this Composite Task, she suggested that the written instructions be enlarged to facilitate readability. Also, the level at which the directions were written presented a problem to this student as evidenced by her inability to read some of the sentences completely without help from the observer.

			#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#	
	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F

COMMENTS

(Dietetic Assistant Cont.)

The student directions have been revised. The layout of pages have also been changed to facilitate readability. The calorie chart has also been changed to enable the student to more easily interpret the information given.

			#1		#13		#15		#17		#18		#19		#20		#23		#25		#32		#39		#40		#47		#48		#51		#		#		#		#		#	
Building Maintenance and Engineering	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
		x		x		x	x		x		x		x		x		x		x		x		x		x		x		x		x											

COMMENTS

This student was not able to pass this Composite Task primarily because of her mobility problems. She uses crutches to ambulate and therefore is not able to carry items (pail, etc.) in her hands while she is walking. Also she could not stand unaided and therefore could not erace and wash the board as directed. She suggested revision of the student directions. Subsequently, these directions were printed in the VI mode.

(Revisions on back)

The suggested. revisions to the student directions were completed in the VI mode. This mode was found to be much easier for the student to read, and as a

Student (2)

CLASS POHI (H. S.)

DATE 6/8/77

COMPOSITE TASK	Comp. Task		SUBTASK																																								REVISIONS
			#9		#23		#24		#25		#33		#40		#48		#51		#		#		#		#		#		#		#		#		#		#		#		#		
	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
Employment Application I	x		x		x		x		x		x		x		x		x																										Enlarged, and darkened application sheet printing.
COMMENTS			This minimally involved, physically impaired student experienced little difficulty with this Composite Task or its Subtasks.																																								
			#18		#19		#20		#21		#22		#23		#24		#25		#32		#33		#39		#40		#47		#48		#51		#52		#		#		#		#		
	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
Dietetic Assistant	x		x		x		x		x		x		x		x		x		x		x		x		x		x		x		x		x										Revised the student instructions to VI mode standards.
COMMENTS			This student successfully completed the Composite Task and the associated Subtasks.																																								
			#1		#13		#15		#17		#18		#19		#20		#23		#25		#32		#39		#40		#47		#48		#51		#		#		#		#		#		
	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
Building Maintenance and Engineering	x		x		x		x		x		x		x		x		x		x		x		x		x		x		x		x												The student directions have been revised to the VI mode standards.
COMMENTS			This student could successfully complete this Composite Task and its associated Subtasks.																																								
			#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		
	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
COMMENTS																																											

Student (3)

CLASS POHI (H. S.)

DATE 6/7/77

COMPOSITE TASK	Comp. Task		#9		#23		#24		#25		#33		#40		#48		#51		#		#		#		#		#		#		#		#		#		#		#		#	
Employment Application I	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	x			x	x		x		x		x		x		x		x																									

COMMENTS

Although this wheelchair-bound student could not walk, he is independently mobile. He was successful in completing all the subtasks, except #9, walking.

REVISIONS

The composite task has been revised to eliminate subtask #9, walking since walking specifically is not needed to perform the task A degree of independent*

			#18		#19		#20		#21		#22		#23		#24		#25		#32		#33		#39		#40		#47		#48		#51		#52		#		#		#		#	
Dietetic Assistant	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	x		x		x		x		x		x		x		x		x		x		x		x		x		x		x		x		x									

COMMENTS

This student was able to successfully complete this Composite Task.

Student directions have been revised to VI mode.

			#1		#13		#15		#17		#18		#19		#20		#23		#25		#32		#39		#40		#47		#48		#51		#		#		#		#		#	
Building Maintenance and Engineering	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
		x		x	x		x		x		x		x		x		x		x		x		x		x		x		x		x											

COMMENTS

Although this student was able to complete all but one of the subtasks, he failed the Composite Task. The subtask failed, standing, is essential to completing the Composite Task. The student must stand to reach the top of the board. Without this ability, completion of the Composite Task is not possible. Also, the probability of success in the projected vocational area would not be high.

The student directions have been revised to the VI mode.

			#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#		#	
	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F

COMMENTS

*mobility is needed, however. This wheelchair bound student displayed enough mobility to acquire the needed materials and complete the task.

CLASS VI

APPENDIX P: MODULE EVALUATION FORM, VISUALLY IMPAIRED STUDENT

NAME David Kelley

MODULE NUMBER AND TITLE	Student Information								Field Tester Information				
	Easy to read Y S N	Easy to under-stand Y S N	Steps easy to follow Y S N	Pic-tures Y S N	Enough infor-mation Y S N	Able to do Y S N	Module rating A B C D	Revisions	Time	Beh. Obs.	Ask for help	Revisions or comments	Tape Comments, Speed
*4501 03 027 7 Preparing Coffee ✓	x	x	x	x	x	x	x	10/4/77 Vision 20/160 Eye position 8-10 inches lots of head movement-	3 min.		—	Student felt that the spaces between words too large & slowed speed down	c̄ out tape
4501 05 011 7 ✓ Helping Diabetic Pts Plan for Food Purchase	x	x	x	no pictures	x	x	x	lt to rt. Pictures – line clarity + size – good	3 min.		—	Student felt that some of book info should be in mod—that's why	c̄ out tape
③ 4501 05 001 7 Using the Diet ✓ Instruction Sheet	x	x	x	no pict.	x c̄ outside reading	x	x	liked 1½ spaces betw lines – did not need marker	1 min. c̄ tape	e. interest in the tape compressor pitch	* —	couldn't do steps commented that double space betw words bugging him	1 min. c̄ tape fastest speed was used to listening c̄ tape
④ 4501 04 009 7 Preparing Meat, Poultry + Fish	x	x	x	x	x	x	x	Print – easy to read – size acceptable. Student was college-prep – "reads about 300 pages" so was not fatigued	5 min. c̄ tape	e. Student was very interested in the tape compressor. He had variable speed tape recorder but was getting tired of hearing high pitch.	* —	Student liked spacing (double + 1½ spaced) with fast tape speed because could pick up words up faster.	5 min. c̄ tape fastest speed
⑤ 4501 04 025 7 Supervising the Production of Food Items	x	x	x	no pict.	x	x	x	Arrows – not necessary because scan the whole page before reading	2 min. c̄ tape		—	With tape cannot daydream -tape needs corrections made	2 min. c̄ tape fastest speed
⑥ 4501 04 011 7 Preparing Vegetables	x	x	x	x	x	x	x	Page size + spiral liked size	4 min.		* —	Student emphasized that all outside readings need to be in large print	c̄ out tape
⑦ 4501 03 026 7 Cleaning a ✓ Conveyor Belt	x	x	x	no pict.	x	x	x	*felt j.s. #2 needs clarifications	1 min. c̄ tape		—	Student liked the female reader over the male reader because of speed– female read faster	1 min. c̄ tape
⑧ 4501 03 031 7 ✓ Pot + Pan washing in a 3 Compartment Sink	x	x	x	x	x	x	x	*picture #12 j.s. needed to be more distinct	3 min. c̄ tape		—		3 min c̄ tape
⑨ 4501 03 024 7 Cleaning a Food Warmer	x	x	x	x	x	x	x	recall excellent	2 min. c̄ tape		—		2 min. c̄ tape
⑩ 4501 04 010 7 Preparing Egg, Milk, Cheese, Casserole Dishes	x	x	x	x	x	x	x	models in j.s. need "7"	3 min. c̄ tape		—		3 min. c̄ tape

APPENDIX Q: TAPED MODULES

TAPES:

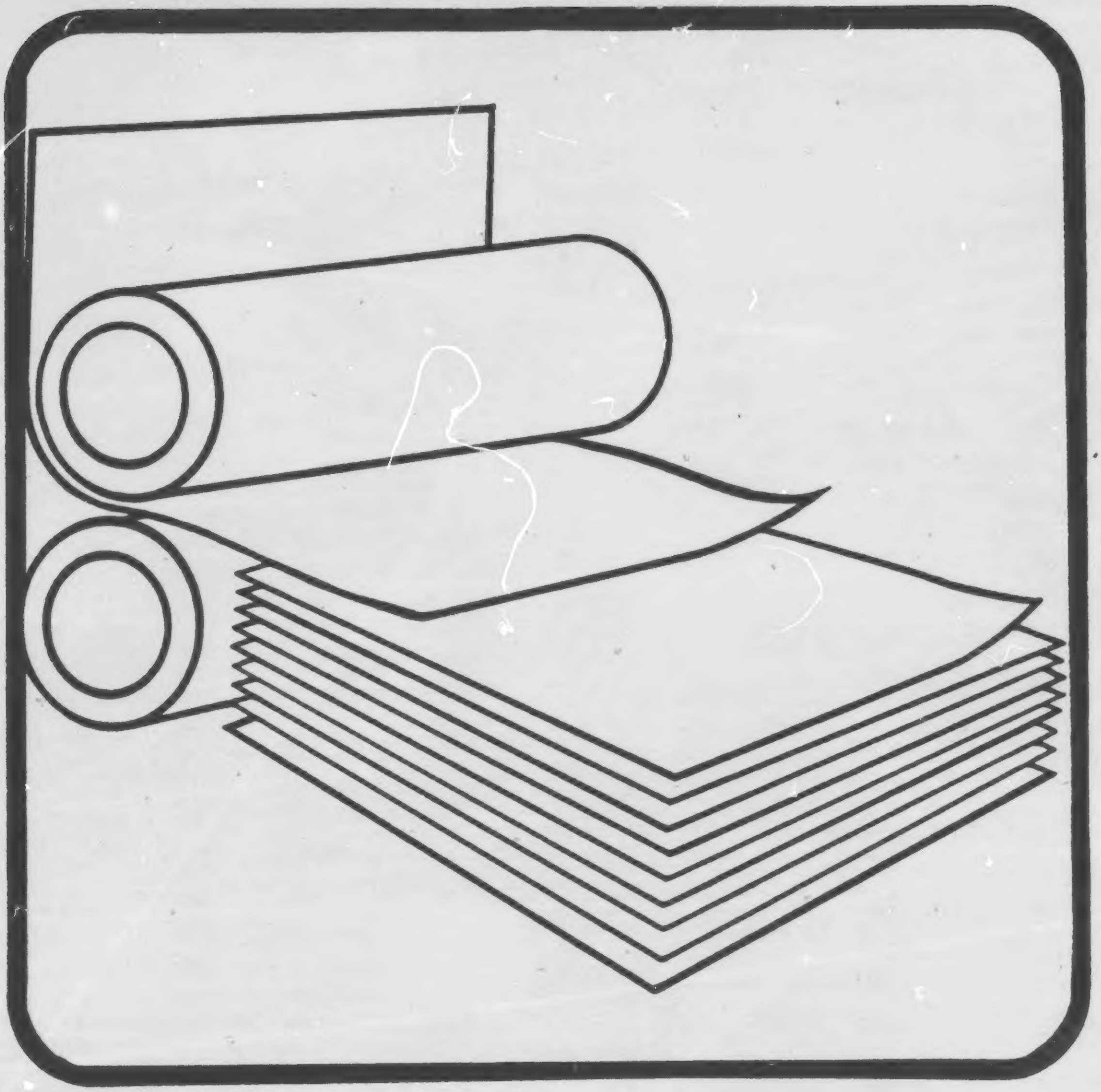
LOW READER:

- GRAPHICS - all modules
- MEDICAL ASSISTANT - all modules
- DIETETIC ASSISTANT - all modules

VISUALLY IMPAIRED:

- MEDICAL ASSISTANT - clerical modules
- DIETETIC ASSISTANT - all modules
- SMALL ENGINE REPAIR - all modules
- BUILDING MAINTENANCE - hospital custodial modules
- GRAPHICS - paste-up technician (Preparing Copy for Reproduction) modules

APPENDIX R: REVISED MODULE, GRAPHICS PROGRAM



graphics

unit: PREPARING COPY FOR REPRODUCTION

capital area career center

1401 09 009
module: 1401 09 009 3 date: JULY 1977 level: IV

skill title: PREPARING SIMPLE AND COMPLEX CROSS-RULED FORMS

developed & written by: NANCY LOMBARDI

visuals by: NANCY LOMBARDI

PERFORMANCE OBJECTIVE

YOU ARE GOING TO LEARN:

HOW TO PREPARE SIMPLE AND COMPLEX CROSS-RULED FORMS.

IN ORDER TO DO THIS YOU WILL NEED:

THREE RAPIDOGRAPHS - HEAVY, MEDIUM, AND THIN RULE
BLACK INK
T-SQUARE
TRIANGLE
RULER
4H PENCIL
#32 LEDGER
MASKING TAPE

WE WILL KNOW YOU CAN DO IT WHEN:

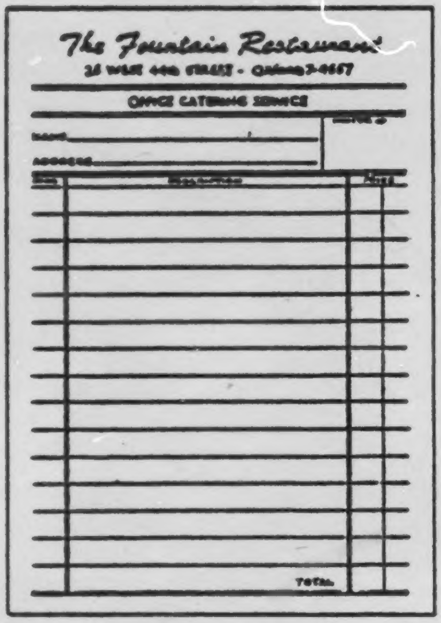
1. YOU COMPLETE THE ASSIGNMENT NEATLY AND ACCURATELY.
2. YOUR INKED LINES AND CORNERS ARE CLEAN, NEAT, AND SHARP.

WORD GUIDE

IRREGULAR	DIFFERENTLY OR ODDLY SHAPED.
PREPARATION	THE ACT OF GETTING READY.
MATHEMATICALLY	USING MATH.

INFORMATION

SIMPLE AND COMPLEX CROSS-RULED FORMS ARE OFTEN USED IN BUSINESS (CHARTS, GRAPHS, ORDER BLANKS, RECEIPTS, ETC.). HERE ARE JUST A FEW EXAMPLES:



The Fountain Restaurant

OFFICE CATERING SERVICE

TOTAL

THE MOST IMPORTANT THING TO LEARN IS HOW TO DIVIDE ODD-SIZED AREAS INTO EQUAL SPACES, ESPECIALLY IN THE PREPARATION OF CHARTS, AND GRAPHS. A FAST AND ACCURATE SYSTEM IS THE "DIAGONAL APPROACH PRINCIPLE". THIS INVOLVES THE USE OF THE RULER TURNED DIAGONALLY TO MEASURE OFF EQUAL DISTANCES WITHIN IRREGULAR OR ODD-SIZED AREAS. FOR INSTANCE: DIVIDE 12 INTO 13 EQUAL PARTS. IN ORDER TO DO THIS MATHEMATICALLY (SO THAT THE PARTS CAN BE MEASURED WITH A RULER) YOU WOULD NEED A COMPUTER. WITH THE "DIAGONAL APPROACH PRINCIPLE" (D. A. P.), IT CAN BE DONE EASILY.

FOLLOW THESE STEPS:

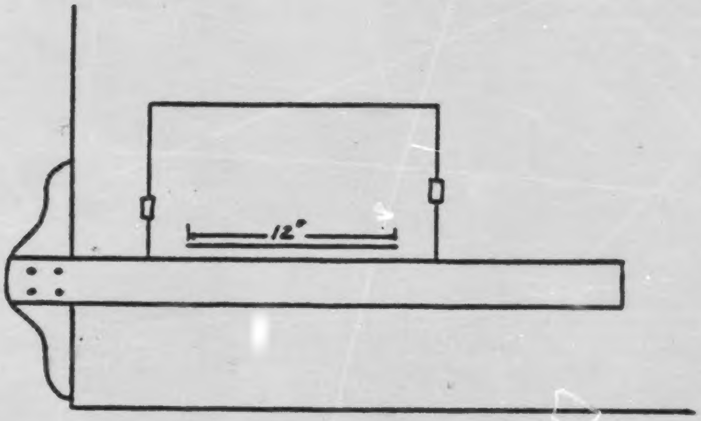
WORD GUIDE

PIVOTING - SWINGING AROUND A FIXED POINT.

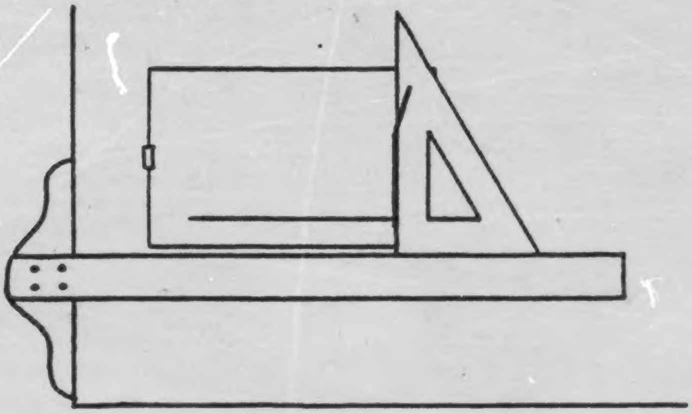
VERTICAL - UP AND DOWN (TOP TO BOTTOM).

INFORMATION

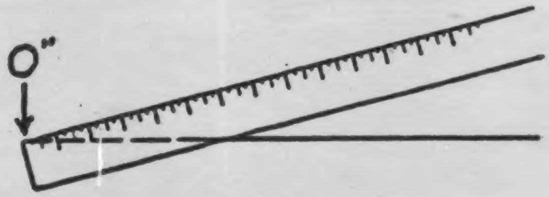
1. WITH A T-SQUARE, DRAW A HORIZONTAL LINE EXACTLY 12" LONG IN PENCIL.



2. WITH T-SQUARE AND TRIANGLE, LIGHTLY DRAW A VERTICAL LINE AT THE RIGHT-HANDED END OF THE 12" LINE.

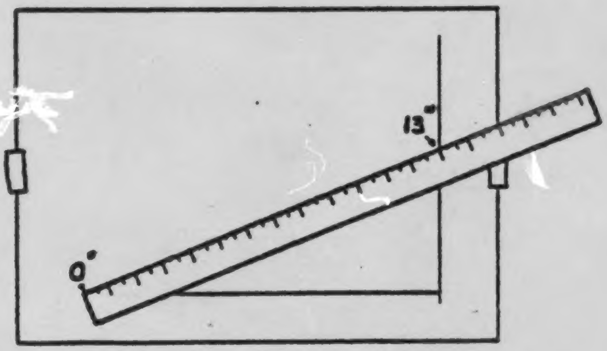


3. PLACE THE ZERO MARK OF YOUR RULER EXACTLY AT THE LEFT HAND END OF 12" LINE.

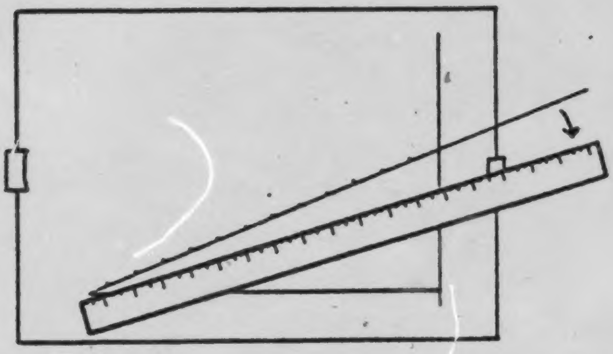


INFORMATION

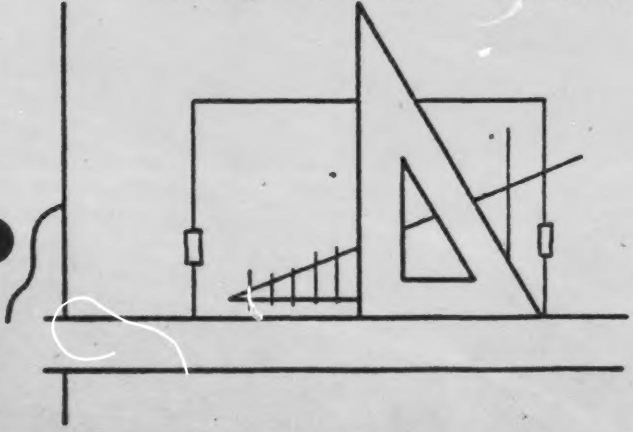
4. PIVOTING THE RULER AT THIS POINT (STEP 3), SWING THE OTHER END UNTIL THE 13" MARK TOUCHES THE VERTICAL LINE.

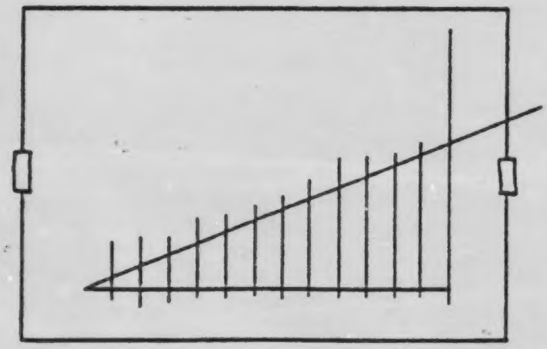


5. ONCE YOU GET THIS DIAGONAL POSITION, HOLD YOUR RULER FIRMLY IN PLACE AND DRAW A LIGHT PENCIL LINE ALONG ITS EDGE. NOW, (RULER STILL IN PLACE), MARK OFF EACH INCH (13 EQUAL PARTS).



6. REMOVE THE RULER AND, WITH T-SQUARE AND TRIANGLE, LIGHTLY DRAW VERTICAL PENCIL LINES ACCURATELY THROUGH EACH MARK ON THE DIAGONAL LINE AND THROUGH THE 12" LINE. YOU HAVE DIVIDED 12" INTO 13 EQUAL PARTS.





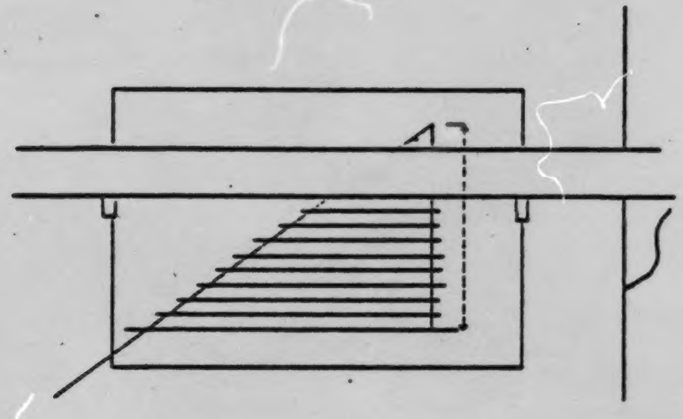
WORD GUIDE

DIVIDABLE - CAPABLE OF BEING DIVIDED.

INFORMATION

THIS D. A. P. METHOD WORKS FOR ANY EQUAL SPACING DIVISION PROBLEM. FOR EXAMPLE: 9" INTO 6 EQUAL PARTS: PIVOT ON ZERO TO 12" AND MARK OFF EVERY 2" (12 ÷ 2 = 6); 20" INTO 8 EQUAL PARTS: PIVOT ON ZERO TO 24" AND MARK OFF EVERY 3" (24 ÷ 3 =8); ETC.

TO GET THE EQUAL SPACING OF AN ODD-SIZED VERTICAL DISTANCE, THE METHOD IS THE SAME EXCEPT: USING A T-SQUARE, DRAW A HORIZONTAL PENCIL LINE AT ONE END OF THE VERTICAL. THEN, DRAW THE LINE THROUGH EACH MEASURED MARK AND THE VERTICAL LINE.



TO USE THE DIAGONAL APPROACH PRINCIPLE, YOU NEED TO KNOW:

1. THE MEASUREMENT THAT MUST BE DIVIDED INTO EQUAL PARTS.

2. THE NUMBER OF EQUAL PARTS DESIRED.

3. A MEASUREMENT LARGER THAN #1 AND EASILY DIVIDABLE BY #2.

NATURALLY, THE D. A. P. METHOD IS USED FOR THE DIVISION OF ODD-SIZED (8 3/8", 3 5/16", ETC.) INTO EQUAL PARTS ONLY. TO FIND THE DIVISION (1") OF THE 12" INTO 12 EQUAL PARTS YOU DO NOT NEED THE DIAGONAL APPROACH PRINCIPLE (NOT 5" INTO TWO EQUAL PARTS (2½); 6" INTO 3 EQUAL PARTS (2"), ETC.).

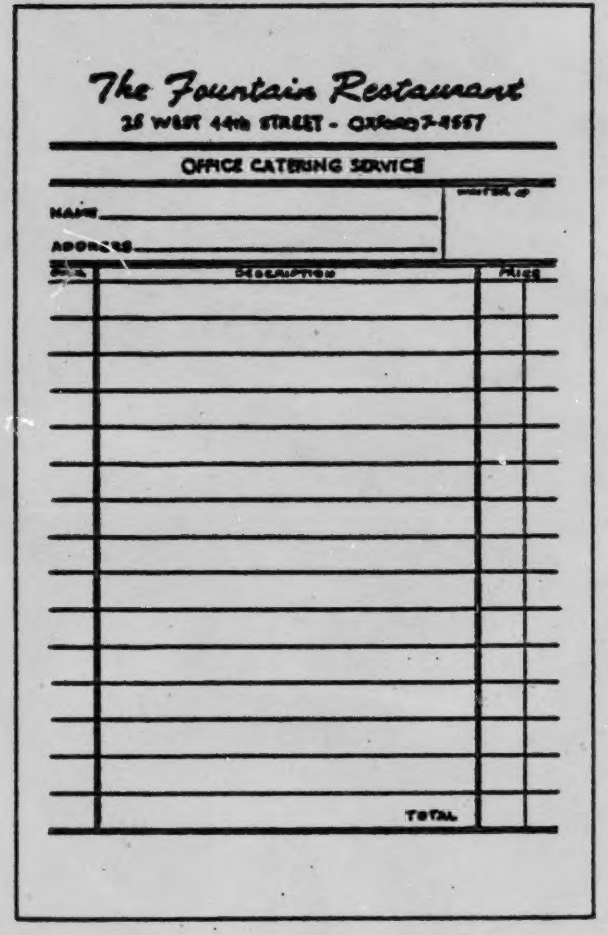
WHEN YOU MUST PREPARE A JOB THAT DOES NOT REQUIRE EQUALLY SPACED AREAS (SUCH AS A RESTAURANT RECEIPT FORM), TAKE INTO ACCOUNT HOW MUCH SPACING IS NEEDED FOR EACH AREA. FOR EXAMPLE: (SEE ILLUSTRATION ON NEXT PAGE)

WORD GUIDE

MINIMUM - LOWEST POSSIBLE NUMBER

MAXIMUM - HIGHEST POSSIBLE NUMBER

INFORMATION



The Fountain Restaurant
25 WEST 44th STREET - OXford 7-4557

OFFICE CATERING SERVICE

NAME____________________

ADDRESS____________________

DESCRIPTION

PRICE

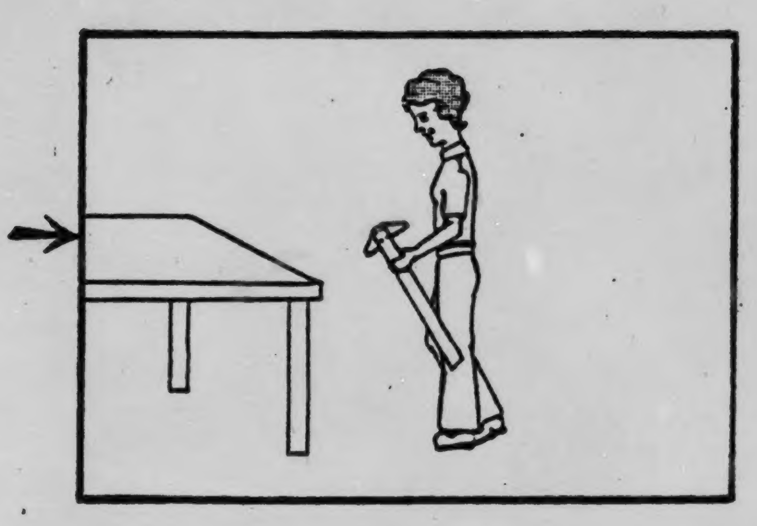
TOTAL

HEAVY LINES ARE USUALLY USED FOR BORDERS OR TO SEPERATE IMPORTANT AREAS (QUANTITY, ITEM DESCRIPTION, PRICE, ETC.). THINNER LINES ARE USED FOR LESS IMPORTANT DIVISIONS.

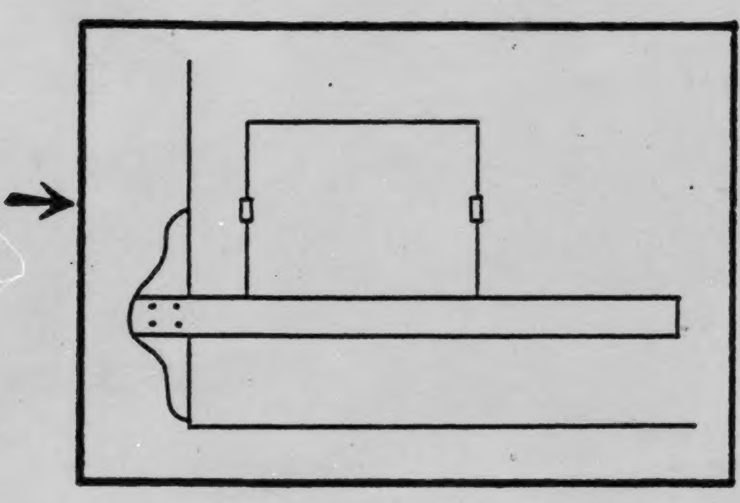
REMEMBER: KEEP THE NUMBER OF DIFFERENT LINE WEIGHTS TO A MINIMUM (THREE IS USUALLY THE MAXIMUM NUMBER) SO THAT THE FORM DOES NOT BECOME CONFUSING. A SIMPLE OR CROSS-RULED FORM SHOULD BE EASILY READABLE AND WELL-BALANCED.

JOB STEPS

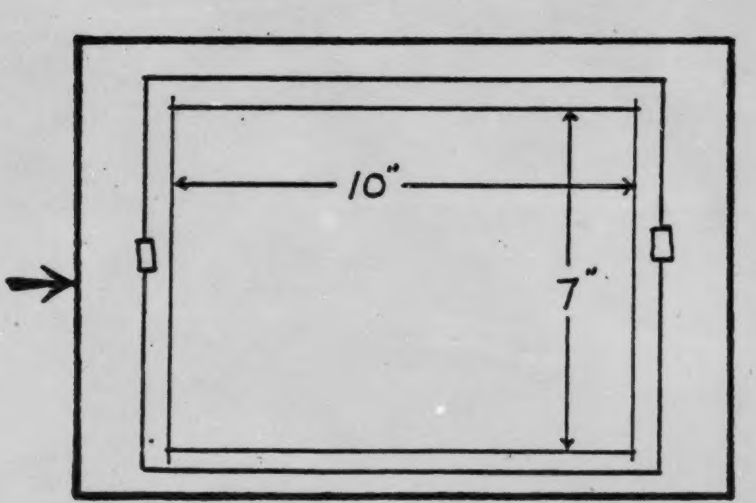
1. TAKE ALL MATERIALS AND EQUIPMENT TO YOUR WORK AREA.



2. LINE UP AND TAPE DOWN #32 LEDGER ALONG 11".

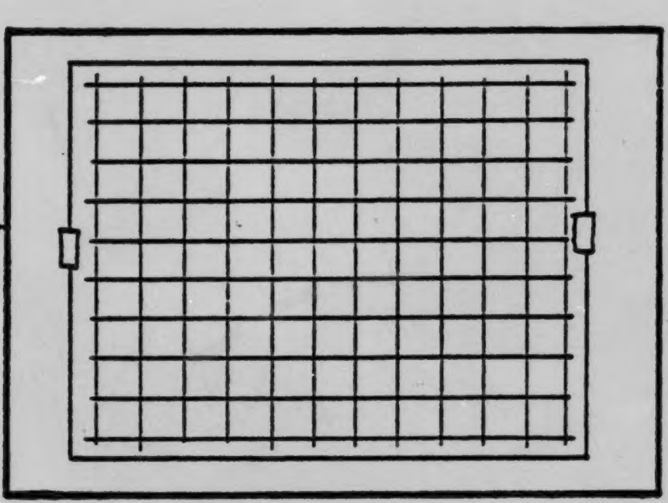


3. IN PENCIL, LIGHTLY DRAW A 10" X 7" RECTANGLE (1/2" MARGIN ALL AROUND).

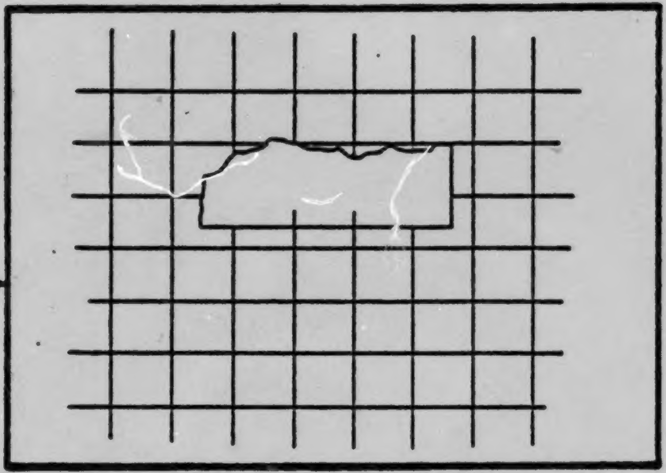


JOB STEPS

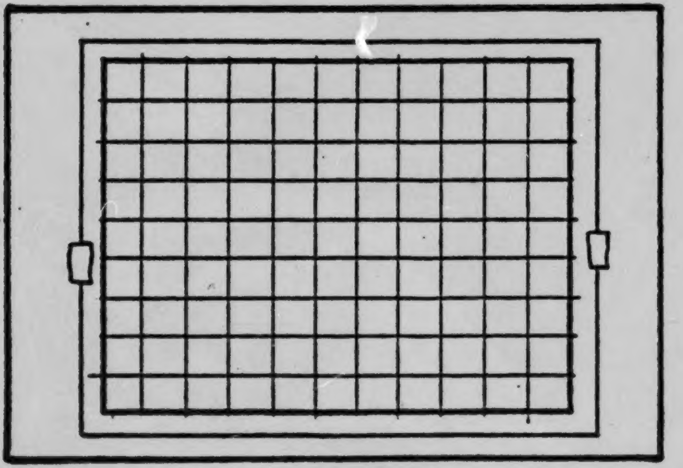
4. USING THE D. A. P. METHOD, DIVIDE THE 10" X 7" AREA INTO 11 EQUAL VERTICAL COLUMNS (10" ÷ 11) AND 9 EQUAL HORIZONTAL COLUMNS (7" ÷ 9) DRAW THESE DIVISIONS IN PENCIL BEFORE INKING.



5. CHECK TO SEE THE COLUMNS ARE EQUAL BY MARKING ONE OFF ON A PIECE OF SCRAP PAPER AND COMPARING THIS DISTANCE WITH THE OTHER COLUMNS.

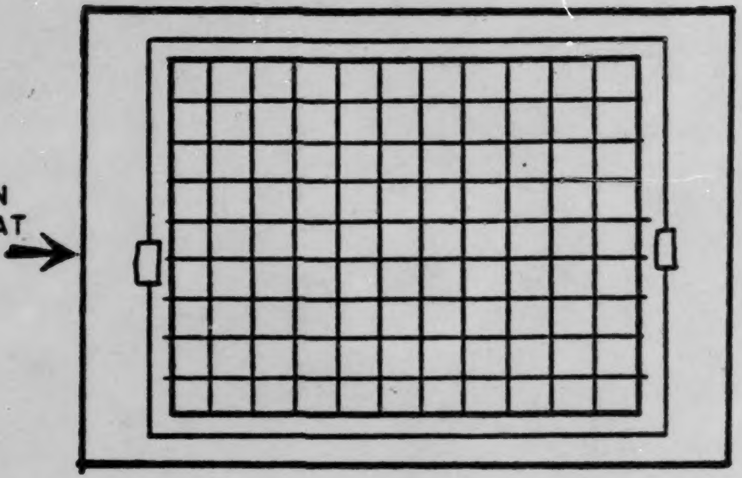


6. WITH A HEAVY RULE, INK IN THE OUTSIDE BORDER (10" X 7" RECTANGLE) STOPPING AT THE CORNERS.

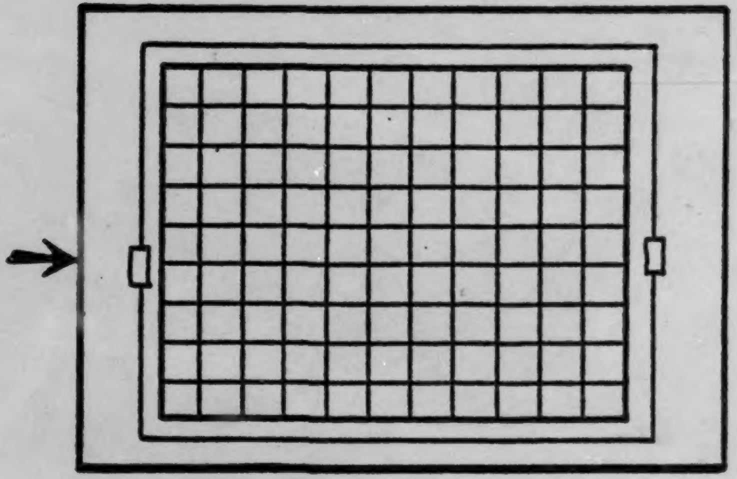


JOB STEPS

7. WITH A MEDIUM RULE, INK IN THE VERTICAL LINES, STOPPING AT THE BORDER.



8. WITH A LIGHT RULE, INK IN THE HORIZONTAL LINES STOPPING AT THE BORDER.



9. WHEN THE INK IS COMPLETELY DRY, ERASE THE PENCIL LINES AND SHOW THE FINISHED PIECE TO YOUR INSTRUCTOR.

APPENDIX S

VALIDATED
INSTRUCTION
ASSOCIATES, INC.

P. O. BOX 386
ALBION, MICHIGAN 49224
(517) 629-9510

TO: Multiple Learning Strategies Sex and Minority Panel

FROM: Kirsten Hinsdale, Vice President
Research and Development

Date: April 30, 1977

RE: Procedures for Evaluation of MLSP Modules

Enclosed are seven randomly selected teaching modules from the Multiple Learning Strategies Project of the Capital Area Career Center in Ingham Intermediate School District. As we arranged with you by phone, your task in connection with the project will be to act as part of the two-member Sex and Minority Panel subcontracted by VIA, Inc. to assess the extent to which selected modules from the MLSP are "without sex bias, and portray women and minorities in non-traditional roles" (from MLSP Proposal).

The enclosed seven modules are from the Building Maintenance program. The Sex and Minority Panel will also evaluate seven modules each from the Medical Assistant, Graphics, Dietetic Assistant, and Small Engine Repair programs. While it was initially planned for the S and M Panel to assess all programs at the same time, production lags in the MLSP have forced us to evaluate modules as they become available. The next batch should be available some time in June, and the remaining three will be available prior to October, 1977.

A total of eight hours has been allotted in the contract for each member of the Sex and Minority Panel to evauate the five programs. Please keep track of the hours and dates you work on the project. You will be required to submit a record of these hours along with your invoice to Validated Instruction Associates, Inc., upon completion of the Sex and Minority Panel function.

Please review the enclosed materials and respond to them briefly, either in writing or on tape, in terms of their sex and minority content. Return them to Validated Instruction Associates, Inc., at the above address, no later than May 15, 1977.

Thank you for your assistance.

APPENDIX T[1]

ASSESSMENT OF BUILDING MAINTENANCE & ENGINEERING MODULES

These modules are being assessed as to the extent to which they are without sex bias and portray women and minorities in non-traditional roles. A real attempt has been made in these modules to do the above and, generally, the attempt is successful. The text itself is carefully asexual. However, as far as the drawings are concerned:

Sex Bias

1. I would like to see the drawings more clearly women in 2201 08 2 3 and 2201 08 002 (it is hard to tell they are meant to be women), and the drawing in 2201 04 2 to be more a woman and less a caricature of a woman (the drawing, in my opinion, is making fun of women at their expense). Other than these instances, the drawings are quite good.

2. In the three review and practice units, there are 2 women portrayed and 27 men. Are only men important when it finally comes to the culmination of the program?

Portray Women and Minorities in Non-Traditional Roles

1. In 2201 05 2 1 women are shown vacuuming and men moving furniture. This seems to me a perfect place (because a woman and a man are shown on the same page) to have them doing nontraditional roles--i.e., men vacuuming and women moving a chair. Other than this unit, I believe women are shown in both traditional and nontraditional roles rather fairly.
2. In 2201 01 15 1 the sole black shown is a caricature--and an unfavorable one at that.

3. It is hard to say whether or not minorities are shown in nontraditional roles, as there are very few minority people portrayed. There are a few blacks--but not nearly enough. And I assume minorities include others aside from blacks. The people portrayed are, with very few exceptions, blond WASP's.

Finally, a comment outside of the role of this assessment: in 2201 01 008--Sealing a Resilient Floor--it seems only proper that "resilient" be one of the words defined in the word guide.

Nora H. Loukides
May 4, 1977

SEX AND MINORITY PANEL REPORT ON BUILDING MAINTENANCE AND ENGINEERING MODULES

After reviewing the seven modules from the Building Maintenance and Engineering Program I felt that on the whole they were well done and a sincere effort had been put forth to refrain from sex bias and to portray women and minorities in non-traditional roles.

The only criticism I found was in the Floor Care Module: The first objection was on page 2201-01-15-1 and I felt that some objection might be made about the appearance of the black man. He looked like a cartoon character. The second was on 2201-01-15-3 and there were no women. Also, notice might be taken of the hands throughout this section. They could be made to look more life like.

Overall, I would like to see more minorities in the illustrations... Chicanos, Orientals, and more blacks.

ASSESSMENT OF MEDICAL ASSISTANT MODULES

The medical assistant modules were well written, without depicting undue sex or minority bias. However, the illustrations did not show any minorities. If Module 4401-07-017 on page 17 intends to portray a black woman, a little shading might be used to convey her minority group.

On module 4401 03 001, "How to do a Patient History," on page 9 the word "ashen" might be used to describe the skin color of blacks and browns, as the equivalent to the whites "pale."

Nancy R. Whitfield
May 1977

APPENDIX T3

ASSESSMENT OF MEDICAL ASSISTANT MODULES

These modules are being assessed as to the extent to which they are without sex bias and portray women and minorities in non-traditional roles.

Sex Bias

The text is quite carefully asexual (and is to be commended for this) except for the occasional slips noted below.

1. In 4401 03 001 and 4401 05 024 the doctor is referred to in masculine terms--his, him and his, He, he his.
2. In 4401 05 024 it is stated that the medical assistant should stay with the doctor during a pelvic exam for, among other reasons, the doctor's legal protection. Would this be necessary if the doctor were a female? Would it be realistic if the medical assistant were a male?

Portray Women and Minorities in Non-Traditional Roles

1. There are no minorities depicted, although there are enough drawings in the modules that they should be.
2. The few pictures of the medical assistant (in 4401 05 024 and 4401 07 012) are all white females--a traditional role.
3. The even fewer pictures of the doctor appear to be white males--again, a traditional role.

In summary, both sex bias and portraying women and minorities in nontraditional roles could be improved in these modules--and with minimum changes.

Finally, a comment outside the role of this assessment: in 4401 07 002, page 4, No. 3, he/she in both places should be changed to him/her to be gramatically correct.

Nora H. Loukides
June 5, 1977

APPENDIX T4

ASSESSMENT OF GRAPHICS MODULES

These modules are being assessed as to the extent to which they are without sex bias and portray women and minorities in non-traditional roles.

The authors are very carefully impartial in the words that they use--"you"--"person"--"customer"--and, finally--"he/she." The latter we liked very much, as it is impartial and also suggests that both men and women can fill the roles mentioned.

Aside from the cover, which is of a male, there is only one other picture of a person--a male. We suggest that a picture of a woman be shown in at least one of the modules. Otherwise the emphasis seems to be very heavily male.

There are a few hands shown, some shaded and some not. The one male shown is shaded so that he can be thought of as Negro. Therefore, minorities are shown in these modules doing things that they do not do traditionally.

We have greatly enjoyed working on the Sex and Minority Panel and are sorry these are the last modules for evaluation. It is evident that the illustrators and authors for all of the modules we have evaluated have tried very hard to avoid any sex bias and to portray women and minorities in non-traditional roles. With very small exception they have succeeded.

Nancy Whitfield

Nora Loukides

January 15, 1978

APPENDIX U: DATA SUMMARY SHEET

DATE: ________

BUILDING MAINTENANCE		TOTAL TIME ALLOTTED STUDENT PROGRESS REPORT									STUDENT ABSENTEE HOURS				NUMBER OF STUDENTS AM PM				NUMBER OF MODS COMPLETED STUDENT MODULE VERIFICATION LIST				DROP OUT RATE			
		TIme				Mods																				
		RV	VI	NR	EMI	RV	VI	NR	EMI		RV	VI	NR	EMI	RV	VI	NR	EMI	RV	VI	NR	EMI	RV	VI	NR	EMI
CUSTODIAN	AM																									
	PM																									
BUILDING MAINTENANCE	AM																									
	PM																									
HOSPITAL CUSTODIAN	AM																									
	PM																									
BUILDING ENGINEER	AM																									
	PM																									
CARPET MAINTENANCE	AM																									
	PM																									
TOTAL																										

M.I.S.P.

GRAPHICS

Unit 2 - Managing

1401 02 020	Managing a Small Inplant Duplicating Department
1401 02 021	Managing an Inplant Print Shop
1401 02 022	Dealing with Printing Requests & Processing

Unit 5 - Inks and Image Carriers

1401 05 001	Ink: Composition, Requirements, Addit. & Purchas.
1401 05 002	Ink: Handling, Mixing, Measuring & Testing
1401 05 003	The Printer's Color Wheel (Ink Mixing)
1401 05 004	Screen Inks: Handling, Mixing, Testing

Unit 6 - Paper

1401 06 001	History, Composition, Manufacturing & Finding Grain
1401 06 002	Grades, Finishes & Kinds of Paper, Making Sample Book
1401 06 003	Estimating & Specifying Paper Needs & Spoilage
1401 06 004	Purchasing Paper & Using a Price Book
1401 06 005	How to Receive, Transport, Store and Handle Paper

Unit 7 - Layout and Design

1401 07 001	Introduction to Graphics Layout & Design
1401 07 002	Lettering & Shades in Graphics Layout & Design
1401 07 003	Spacing & Forming Words in Graphics Layout & Design
1401 07 004	Proportion & Placement: One Unit or Group on a Page
1401 07 005	Shape Harmony: Type Image to Page Shape
1401 07 006	Arrangement & Balance of Various Elements
1401 07 007	Single & Book Page Margins
1401 07 008	Constructing Borders In Graphic Layout & Design
1401 07 009	Eye Movement (Pointing Devices & Eye Directors In Design
1401 07 010	Conventional Tickets
1401 07 011	Business Cards
1401 07 012	Letterheads - Envelopes
1401 07 014	Title Pages in Graphics Layout and Design

1401 07 015	Ornamentation & Distorted Type
1401 07 016	Modern Rule Use (Rules and Borders)
1401 07 017	Type & Text Matter (Use of Type, Spacing, Selection. .)
1401 07 018	Combination Layout Project: "Recruiting Ad"
1401 07 019	Combination Layout Project: "Specialized Ads"
1401 07 020	Combination Layout Project: "Brochure"
1401 07 023	Color Combinations
1401 07 024	Division of Space for Colors or Gray
1401 07 025	Cards: Layout & Design
1401 07 026	Posters: Layout & Design
1401 07 027	Sign: Layout & Design
1401 07 028	Scaling & Copy Preparation
1401 07 029	Newspaper Advertisements
1401 07 030	Newspaper Layouts
1401 07 031	Designing Folders & Brochures
1401 07 032	Advanced Combination Layout
1401 07 033	Advanced Newspaper Layout

Unit 8 - Composition

1401 08 001	Identifying Composition Processes
1401 08 004	Copyfitting
1401 08 005	Proofs, Proofreading & Proofmarks
1401 08 006	Hand-set Type: Basic Tools & Equipment
1401 08 007	Typesetting -- Centering a Line
1401 08 008	Typesetting -- Justification
1401 08 009	Hand Set Type: Basic Typesetting -- Simple Name Card
1401 08 010	Typesetting: Small Form
1401 08 011	Typesetting: Using Rules and Run-Arounds
1401 08 012	Using the Ludlow Line-Casting Machine
1401 08 013	Using the Linotype Line-Casting Machine
1401 08 016	Original Hand-Drawn Art Work and Lettering
1401 08 017	Hand-Drawn Lettering Using Stencils
1401 08 018	Using Mechanical Lettering Devices
1401 08 019	Clip Art and Copyrights
1401 08 020	Using Press Type (Transfer Lettering)
1401 08 021	Using Tab Type (Foto-Type)
1401 08 022	Using Adhesive Tape and Border Materials
1401 08 023	Using Tint Screens & Shading
1401 08 024	Typing Forms on a Typewriter

1401 08 025	Justifying on a Typewriter
1401 08 026	Using the IBM Selectric Composer
1401 08 027	Justifying on the IBM Selectric Composer
1401 08 028	Advanced Composition & Forms on the IBM Selectric Composer
1401 08 029	Using the MTST System
1401 08 020	Using the IBM Composer System
1401 08 031	Using the Varityper
1401 08 034	Using the Strip Printer
1401 08 035	Using the Headliner
1401 08 036	Using the Phototypositor
1401 08 027	Using the ATF Typesetter System
1401 08 038	Using the Compugraphic System
1401 08 040	Using the Varityper Photo-Text System

Unit 9 - Paste-Up

1401 09 001	Handling & Using Paste-Up Tools, Equipment & Materials
1401 09 002	Making a Simple Paste-Up
1401 09 003	Project: Paste-Up Module
1401 09 004	Learning to Use White Space in Paste-Up
1401 09 005	Grouping & Planning Copy in Paste-Up
1401 09 006	Using Tint Screens in Paste-Up
1401 09 007	Using the Ruling Pen
1401 09 008	Using a Rapidograph Ruling Pen
1401 09 009	Preparing Simple & Complex Cross-Ruled Forms
1401 09 010	Paper Finishes & Texture
1401 09 011	Handling Original Photos & Copy
1401 09 012	Scaling Photographs and Copy
1401 09 013	Cropping Photographs
1401 09 014	Simple Program Paste-Up (Single Page)
1401 09 015	Complex Program Paste-Up (Four Page)
1401 09 016	Simple Newspaper Paste-Up (Small, Single Page)
1401 09 017	Simple Newspaper Paste-Up (Small, Four Page)
1401 09 019	Using Register Marks
1401 09 020	Color Paste-Up (Two or Three Opaque Colors)
1401 09 022	Color Paste-Up (Transparent Colors)
1401 09 023	Color Paste-Up (Imitation Duotone)
1401 09 024	Paste-Up Project
1401 09 025	Advanced Paste-Up Project
1401 09 026	Complex Paste-Up Project

Unit 10 - Camera (Photomechanical Reproduction)

1401 10 001	Photomechanical Orientation & Film Processing
1401 10 002	How to Make a Line Shot on a Process Camera
1401 10 003	Enlargement & Reduction on a Process Camera
1401 10 004	Line Copy for the Process Camera
1401 10 005	Film Exposure: Reproduction & Quality Control
1401 10 006	Film Processing: Reproduction and Quality Control
1401 10 007	The Camera Optical System & F Stops
1401 10 008	Production Experience: Processing Negatives
1401 10 009	How to Make Positives & Negatives on a Contact Frame
1401 10 010	How to Use Photomechanical Transfer Materials
1401 10 011	How to Clean, Maintain a Diffusion Transfer Process
1401 10 012	Exposure & Quality Control with PMT Materials
1401 10 013	How to Make a PMT Screened Print
1401 10 014	Contact Printing
1401 10 015	How to Use Duplicating Film
1401 10 016	Spreads, Chokes & Outline Type by Contact Printing
1401 10 017	How to Use Autopositive Film
1401 10 018	Spectral Sensitivity with Panchromatic Film
1401 10 019	Selective Spectral Sensitivity with Color Filters
1401 10 020	Basic Halftone Photography
1401 10 021	How to Use the Kodak Halftone Exposure Computer
1401 10 022	Making PMT Halftone Prints
1401 10 023	Making Halftone Negatives
1401 10 024	Experimenting with Halftone Dot Ranges & Corrections
1401 10 025	Rescreening Printed Halftones
1401 10 026	Using Kodalith Autoscreen Ortho Film
1401 10 027	Special Halftone Screens & Effects
1401 10 028	How to Make a Duotone
1401 10 029	How to Make a Posterization
1401 10 030	How to Make a Dropout & Phantom Halftone
1401 10 031	Advanced Combination Project
1401 10 032	Color Separation (35 mm Photography)

Unit 11 - Stripping

1401 11 001	Basic Tools and Equipment Used in Stripping
1401 11 002	Basic Procedure for "Laying Out a Flat"
1401 11 003	Basic Procedure for "StrippingIn" Negatives

1401 11 004	Simple Imposition for Stripping Two Negatives in Register
1401 11 005	Multiple Imposition: Stripping a Four-Page Work and Tumble Job
1401 11 006	Multiple Imposition: Stripping Eight Negatives in Register
1401 11 007	Making a Simple Break for Color Using Rubylith
1401 11 008	Stripping-In Windows, Halftones and Negative Corrections
1401 11 009	Scribing Rules, Borders, Boxes & Windows
1401 11 010	Stripping for Screen Tints & Double Burns
1401 11 011	Stripping for "Step & Repeat" and Pin Register
1401 11 012	Making a Mechanical Fake Four-Color Separation
1401 11 013	Stripping for Combinations (Photographs & Type)
1401 11 014	Multiple Imposition: 16-Page Folder
1401 11 015	Complex Stripping Project: 4-Page 8 1/2" x 11" Newspaper
1401 11 016	Complex Stripping Project: Brochure
1401 11 017	Complex Stripping Project: Advanced

Unit 12 - Platemaking

1401 12 001	Basic Tools, Equipment & Platemaking Methods
1401 12 002	Relief Printing Plates
1401 12 003	Exposing & Processing Additive Offset Plates
1401 12 004	Exposing & Processing Subtractive Offset Plates
1401 12 005	Determining Exposure Time with Sensitivity Guides
1401 12 006	Making a Proof
1401 12 007	Proofing: Exposure & Processing of 3M Color-Key
1401 12 008	Making a Direct Image Paper Master
1401 12 009	Producing Electrostatic Masters (#2000 Electrostatic Copier)
1401 12 010	Hand-Cut Screen Printing Plates (Stencils)
1401 12 011	Photographic Screen Printing Plates (Film Stencils)
1401 12 012	Electronic Scanner (Platemaking)
1401 12 013	Color Separations on the Electronic Scanner

Unit 13 - Presswork

1401 13 101	Using Letterpress Tools, Equipment & Methods
1401 13 102	Platen Press Lock-Up
1401 13 103	Platen Press Preparation
1401 13 104	Platen Press Makeready
1401 13 105	Printing and Clean Up On A Platen Press
1401 13 106	Producing a 2-color Job on a Platen Press

1401 13 107	Basic Production Printing ona Platen Press (Numbering & Perforating)
1401 13 108	Operating a 10 x 15 Heidelberg Platen Press
1401 13 109	Printing a Solid, Long Run Form on the Heidelberg Platen
1401 13 110	Production Work on the Heidelberg Platen Press
1401 13 201	Using Basic Offset Printing Tools, Chemicals, Equipment & Safety Rules
1401 13 202	Operation of the A.B. Dick Offset Duplicator
1401 13 203	How to Run & Hold Tight Registration on the A.B. Dick
1401 13 204	How to Run Basic Production Work on the AB Dick Offset
1401 13 205	Operation of the Chief 17 Offset Press
1401 13 206	Operation of the Multilith 1250 Offset Duplicator
1401 13 208	Operation of the Multilith 2850 Automated Offset
1401 13 209	Operation of the Heidelberg Kord Offset Press
1401 13 210	Electrostatic & Direct Image Masters
1401 13 211	How to Clean the A.B. Dick Offset Duplicator
1401 13 212	How to Check & Adjust Ink Dampner, and Blanket Cylinder Pressures
1401 13 213	How to Run 2-Color Registration on the Offset Press
1401 13 214	How to Run 3-Color Registration Work on the Offset
1401 13 215	Running 4-Color Registration Process Registration
1401 13 216	Advanced Production on the Offset Presses
1401 13 217	How to Lubricate the A.B. Dick Offset Duplicator
1401 13 218	Advanced Production, Maintenance & Job Organization on an Offset
1401 13 302	Preparing the Screen & Frame
1401 13 303	Producing a Single Color Screen Job
1401 13 304	Producing a Multicolor Screened Job
1401 13 306	Operation of the Automatic Screen Press

Unit 14 - Finishing and Bindery

1401 14 001	Identifying Finishing & Bindery Processes
1401 14 002	Paper & Printed Material Handling, Jogging & Stacking
1401 14 003	Counting Paper
1401 14 004	Using a Hand Numbering Machine
1401 14 005	Padding: Basic Padding Techniques
1401 14 006	Padding: Using Pressure Unit & Press
1401 14 007	Padding: Perfect Binding
1401 14 008	Gathering: By Hand & By a Semi-Automatic Collator
1401 14 009	Gathering: Automatic Collator & Stitcher

1401 14 010	Cutting: Table Model Triumph Hand Lever
1401 14 011	Cutting: Basic Operation, Challenge Power Cutter
1401 14 013	Cutting: Maintenance of Challenge Power Cutter
1401 14 014	Stapler: Operation & Maintenance of a Hand or Electric Stapler
1401 14 015	Stitcher: Basic Operation of an Acme-Interlake Stitcher
1401 14 016	Stitcher: Advanced Operation and Upkeep of an Acme-Interlake Stitcher
1401 14 017	Drill: Basic Operation of a Challenge Power Drill
1401 14 018	Drill: Advanced Operation, Slitting, Slotting & Round Cornering
1401 14 019	Packaging: Hand Wrapping in Shrink Plastic
1401 14 020	Packaging: Hand Wrapping in Draft-Wrapping Paper
1401 14 021	Packaging: For Shipping, Mailing & Storage
1401 14 023	Folder: Using a Small Table Model Folder
1401 14 024	Folder: Perforating & Scoring ona Table Model Folder
1401 14 025	Folder: Basic Operation of a Baum Folder
1401 14 026	Folder: Signature & Right-Angle Folding on a Baum Folder
1401 14 027	Folder: Pasting, Perforating & Scoring on a Baum Folder

Unit 15 - Special Processes

1401 15 001	Making a Rubber Stamp
1401 15 003	Embossing With Virkotype Powder
1401 15 004	Signpainting: Small Posters & Placards
1401 15 005	Signpainting: Larger Posters & Pennants
1401 15 006	Operating the Sign Press
1401 15 007	Operating a Spirit Duplicator (& Making a Spirit Master)
1401 15 008	Operating a Mimeograph Stencil Duplicator
1401 15 009	Operating an Electrostatic Copier

Unit 16 - Photography (Continuous Tone)

1401 16 001	The Basics of the Camera, Film, and Chemical Processing
1401 16 002	Photography with Pin-Hole Camera
1401 16 003	Cameras & Basic Camera Operation
1401 16 004	35mm Film Developing
1401 16 005	Contact Printing & Paper Processing
1401 16 006	Basic Enlarger Use: Dodging, Burning & Exposure Tests
1401 16 007	Cropping, Mounting & Display of Prints
1401 16 008	Studio Lighting
1401 16 009	Advanced Enlarger Use & Print Correction
1401 16 010	Photo Assignment & Production

BUILDING MAINTENANCE & ENGINEERING

Unit 1 Floor Care

2201 01 001	Dustmopping (Resilient & Hard Floors)
2201 01 002	Damp Mopping
2201 01 003	Wet Mopping to Remove Dirt & Grease
2201 01 004	Wet Mopping to Disinfect
2201 01 005	Floor Stripping (Resilient Floor)
2201 01 006	Waxing Floors
2201 01 007	Spray Buffing
2201 01 008	Sealing a Floor (Resilient)
2201 01 011	Operation & Use of Wet Vacuum
2201 01 012	Use of Automatic Floor Machine
2201 01 013	Floor Machine (Buff Floor)
2201 01 014	Sweeping & Mopping Stairs)
2201 01 015	Review & Practice
2201 01 016	Care of Hard Surface Floors
2201 01 017	How to Treat a Dust Mop

Unit 2 - General Maintenance Task

2201 02 001	Fluorescent Lamp Replacement
2201 02 002	Fluorescent Fixture Shade and Tube Washing
2201 02 003	Spot Clean & Wash Walls
2201 02 004	Window Washing & Spotting
2201 02 006	Metal Polishing
2201 02 007	Security
2201 02 008	The Removing, Cutting and Replacing of Broken Glass
2201 02 009	Repair Damaged Wall
2201 02 011	Interior Painting
2201 02 012	Exterior Painting
2201 02 013	Repairing Dripping Faucets
2201 02 014	Clearing Clogged Drains & Traps
2201 02 015	Fire Equipment - Extinguishers
2201 02 016	Repair Blistered & Cracked Gravel & Tar Type Roof
2201 02 017	Cleaning Aluminum Surfaces
2201 02 018	Replace Broken Floor Tile
2201 02 019	Use of Tube Cutter (Copper)
2201 02 020	Use of Flaring Tool (Copper)

2201 02 021	Sweating Copper Tubing
2201 02 022	Soldering Copper "T" into Existing Line
2201 02 023	Servicing Air Compressors
2201 02 024	Door Closers
2201 02 025	Operation of the Propane Torch
2201 02 026	Familiarization of Power Threading Machine
2201 02 027	Use of Power Driven Pipe Machine
2201 02 028	Power Tapering of Galvanized Pipe
2201 02 030	Use of Pipe Bender

Unit 3 - Restrooms

2201 03 001	Filling Dispensors
2201 03 002	Sinks & Mirrors
2201 03 003	Toilets & Urinals
2201 03 004	Cleaning Walls & Partitions
2201 03 005	Complete Care of Restrooms

Unit 4 - Chalkboards

2201 04 001	Breaking in a New Chalkboard
2201 04 002	Washing a Chalkboard

Unit 5 - Carpet Care

2201 05 001	Shampoo Carpet (Dry Foam)
2201 05 002	Shampoo Carpet with Rotary Machine
2201 05 003	Vacuuming a Carpet
2201 05 004	Spot Cleaning a Carpet
2201 05 005	Carpet Cleaning with Carpetsheen
2201 05 006	Care of Carpets

Unit 6 -

2201 06 001	Dusting
2201 06 002	Cleaning Desk Tops

Unit 7 -Grounds

2201 07 001	Removal of Snow and Ice
2201 07 002	Lawn Care - Shrubbery
2201 07 008	Mixing & Pouring Concrete Bumpers
2201 07 009	Power Mixing Concrete
2201 07 010	Operation Small Lawn Tractors
2201 07 011	Power Driven Hand Mower
2201 07 012	Mowing with Small Lawn Tractor
2201 07 013	Watering a Lawn
2201 07 014	Use of Mechanical Spreader
2201 07 015	Fertilizing a Lawn
2201 07 016	Prepare Soil for New Lawn
2201 07 017	Planting a New Lawn
2201 07 018	Setting up a Transit
2201 07 019	Edging a Lawn
2201 07 020	Constructing Forms (For New & Replacing)
2201 07 021	Finishing Concrete - Troweling, Curing

Unit 8 Sanitation

2201 08 001	Picking Up Paper & Trash
2201 08 00[illegible]	Disposal of Paper & Trash

Unit 10 Boiler Maintenance and Operation

2201 10 001	Fire Low Pressure Steam Boiler
2201 10 002	Determine Water Level on a Steam Boiler
2201 10 003	Blow Down a Steam Boiler

Unit 20 Power and Hand Tools

2201 20 001	Operation of Sabre Saw
2201 20 002	Operation of Drill Presses
2201 20 003	Operation of Power Sander
2201 20 004	Operation of Table Saw
2201 20 005	Operation of Circular Saw
2201 20 007	Use of Electric Router
2201 20 008	How to Load, Use and Unload a Caulking Gun
2201 20 009	How to Use a Radial Arm Saw
2201 20 011	Using a Screwmate Tool
2201 20 012	Hand Tool Identification

Unit 21 Cabinet Construction

2201 21 001	Working Diagram - Layout
2201 21 002	Cutting Parts for Fabrication
2201 21 003	Construct a Cabinet
2201 21 004	Fabricate Doors - Inset
2201 21 005	Fabricate Doors - Flush
2201 21 006	Fabricate Drawers
2201 21 007	Cabinet Finishing

Unit 22 Repair Damaged Furniture

2201 22 001	Repair Stripped Screw Holes
2201 22 002	Repair Wood Cracks
2201 22 003	Fasten Wood with Dowel Pins

Unit 23 Windows

2201 23 001	Visual Inspection - Windows
2201 23 003	Install Window Hardware
2201 23 004	Lubricate Windows

Unit 24 Door Maintenance

2201 24 001	Visual Inspection & Maintenance of Doors
2201 24 001	Hang a Door
2201 24 003	Install Door Locks

Unit 26 Increase Production Speed

2201 26 001	Build New Structure Within a Time Limit Plus 50%
2201 26 002	Build New Structure Within a Time Limit Plus 25%
2201 26 003	Build New Structure Within a Time Limit

MEDICAL ASSISTANT

Unit 2 Language

4401 02 003	Surgical Language
4401 02 004	How to Know the Meaning of Medical Words #1
4401 02 005	How to Know the Meaning of Medical Words #2
4401 02 006	How to Know the Meaning of Medical Words #3
4401 02 007	How to Know the Meaning of Medical Words #4
4401 02 008	How to Know the Meaning of Medical Words #5
4401 02 009	How to Know the Meaning of Medical Words #6
4401 02 010	How to Know the Meaning of Medical Words #7
4401 02 011	How to Know the Meaning of Medical Words #8
4401 02 012	How to Know the Meaning of Medical Words #9
4401 02 013	How to Know the Meaning of Medical Words #10
4401 02 014	How to Use and Understand Medical Word Elements
4401 02 015	How to Use and Understand Medical Abbreviations
4401 03 000	Receptioning
4401 03 001	How To Do a Patient History
4401 03 002	Receiving Medical Office Visitors
4401 03 003	Deciding the Reason for the Medical Office Visit
4401 03 004	How to Take Information From the Medical Office Visitor
4401 03 005	How to Sort Incoming Mail in the Physician's Office
4401 04 000	Asepsis
4401 04 001	Handwashing for Office Use
4401 04 002	Cleaning Soiled Instruments
4401 04 003	Using Sterile Transfer Forceps
4401 04 004	Packaging an Instrument with Autoclave Paper Wrapper
4401 04 006	How to Wrap and Package Articles for Sterilization
4401 04 009	How to Loan and Operate an Autoclave
4401 04 010	How to Use Chmical Method of Disinfection of Instruments
4401 04 012	Opening Sterile Packages

Unit 5 Examination

4401 05 001	How to Set the Room Up for a Complete Physical
4401 05 002	How to Get a Patient Ready for Examination
4401 05 004	How to Do Infant Measurements
4401 05 005	Weighing of an Infant
4401 05 006	How to Weigh and Measure a Patient's Height on a Beam Scale
4401 05 007	How to Read a Thermometer
4401 05 008	How to Take an Oral Temperature
4401 05 010	How to Take an Infant's Rectal Temperature
4401 05 011	How to Take an Axillary Temperature
4401 05 012	How to Take a Radial Pulse
4401 05 013	How to Count Respirations
4401 05 014	Taking a Blood Pressure
4401 05 015	How to Assist the Doctor With a Physical Exam
4401 05 016	How to Clean Up After a Physical Examination
4401 05 019	How to Get the Equipment Ready and Set Up the Room for a Rectal Examination
4401 05 020	How to Get the Patient Ready for a Rectal Examination
4401 05 021	How to Set Up the Room for a Pelvic Examination
4401 05 022	How to Get the Patient Ready for a Pelvic Examination
4401 05 023	Draping and Positioning the Patient for a Pelvic Exam
4401 05 024	Assisting the Doctor with a Pelvic Examination
4401 05 030	How to Set Up the Equipment for a Venipuncture
4401 02 031	How to Set Up a Hyfrecator Electrocautery for Use and Clean It

Unit 6 Supplies and Equipment Maintenance

4401 06 001	How to Order and Care for Medical Supplies
4401 06 002	How to Order and Care for Laundry
4401 06 005	How to Care for Disposable Hypodermic Syringes and Needles
4401 06 006	How to Maintain and Order Administrative Supplies

Unit 7 Diagnostic Tests

4401 07 001	How to Collect a Urine Specimen From a Patient
4401 07 002	Instructing a Parent to Use an Infant Urice Collector
4401 07 003	Instructing the Patient to Bring a Urine Specimen from Home
4401 07 005	Running a Urinalysis for Specific Gravity
4401 07 006	Testing Urine for Sugar and Acetone Using Tablets
4401 07 007	How to Prepare a Urine Slide for Microscopic Exam

4401 07 008	How to Test Urine for Sugar, Acetone and Protein
4401 07 009	How to Do a Hemoglobin Test
4401 07 010	How to Prepare a Throat Culture to Send to MDPH Lab
4401 07 011	How to Prepare a Genital Smear
4401 07 012	How to Prepare a Blood Sample to Send to MDPH for VDRL Test (for Syphilis)
4401 07 013	How to Prepare Urine Specimen for Bacteriological Exam at MDPH Lab
4401 07 014	How to Get a Sputum Specimen to Send to State Lab for TB Test
4401 07 015	Preparing a Pap Smear and Prepare the Slides for the Lab
4401 07 016	How to Use an Audiometer
4401 07 017	Taking a Electrocardiogram
4401 07 018	How to Do an Eye Test with a Snellen Eye Chart
4401 07 019	Testing Vision Using the Snellen Illiterate "E" Eye Chart
4401 07 020	Doing a White Blood Count
4401 07 021	Doing a Hematocrit Using the Autocrit Centrifuse

Unit 8 Office Surgery

4401 08 001	How to Shave a Surgical Site
4401 08 002	How to Prepare a Surgical Site with Antiseptic Solution
4401 08 003	How to Set Up a Local Anesthetic for Office Surgery
4401 08 004	How to Do a Short Scrub
4401 08 005	How to Dry Hands and Arms After a Surgical Scrub
4401 08 007	How to Put on Sterile Gloves Using the Open Gloving Method
4401 08 008	How to Set Up a Sterile Instrument Tray While Wearing Gloves
4401 08 009	How to Prepare the Equipment and Instruments for a Surgical Procedure
4401 08 012	How to Hold Sterile Gloves for Someone Else to Put On
4401 08 013	How to Assist with a Surgical Procedure
4401 08 015	How to Apply a Dressing After Office Surgery
4401 08 016	How to Prepare a Tissue Specimen for Histology
4401 08 017	How to Remove a Knife Blade From a Knife Handle
4401 08 018	How to Redress a Wound
4401 08 019	How to Clean Up After a Surgical Procedure

Unit 9 Telephoning

4401 09 001	How to Schedule Patient Services by Telephone
4401 09 002	How to Receive a Laboratory Report by Telephone
4401 09 003	How to Change a Surgical Appointment by Telephone
4401 09 004	How to Answer the Phone and Close a Phone Call
4401 09 005	How to Determine the Nature of a Call and Screen Calls
4401 09 006	How to Take Information Over the Phone
4401 09 007	How to Give Information Over the Phone
4401 09 008	How to Interrupt and Re-establish Phone Calls

4401 09 009	How to Find a Local Telephone Number and Other Information in the Phone Book
4401 09 010	How to Find Information on Long Distance Telephone Numbers
4401 09 011	How to Handle Telephone Complaints
4401 09 012	How to Place a Local Telephone Call
4401 09 013	How to Place a Long Distance Call

Unit 10 Bandaging

4401 10 001	Applying a Bandage Using a Circular Turn
4401 10 002	Applying a Tubular Bandage
4401 10 003	Applying a Figure 8 Bandage to the Hand
4401 10 004	Applying a Figure 8 Bandage to an Ankle
4401 10 006	Applying a Bandage to the Finger with Recurrent Turns
4401 10 007	Applying a Triangular Bandage as an Arm Sling

Unit 11 Medications and Treatments

4401 11 002	How to Find Medication Information in the P.D.R.
4401 11 003	How to Classify Drugs
4401 11 004	How to Identify a Drug by Comparing It with Pictured Drugs in the P.D.R.
4401 11 005	How to Read, Write and Phone in a Prescription
4401 11 006	How to Draw Medication From a Vial Into a Syringe
4401 11 009	Cleaning a Glass Syringe

Unit 12 Review for Competency

4401 12 001	Competency Check #1
4401 12 002	Competency Check #2
4401 12 003	Competency Check #3
4401 12 004	Competency Check #4
4401 12 005	How to Combine Single Skills Into a Group of Medical Office Skills #1
4401 12 006	How to Combine Single Skills Into a Group of Medical Office Skills #2
4401 12 007	How to Combine Single Skills Into a Group of Medical Office Skills #3
4401 12 008	How to Combine Single Skills Into a Group of Medical Office Skills #4

Unit 13 Third Party Billing

4401 13 001	Introduction to Third Party Billing
4401 13 004	How to Fill Out the Forms for Medicare Billing
4401 13 005	Workmen's Compensation, Medical
4401 13 006	Workmen's Compensation, Surgical
4401 13 007	Third Party Billing Using a Standard Medical/Surgical Form
4401 13 009	How to Find Out if a Person's Bill Should be Sent to Medicaid
4401 13 010	How to Fill Out a Michigan Medical Claim Form for Medicaid Billing
4401 13 011	How to Find Out If a Person's Bill Should be Sent to Blue Shield
4401 13 012	How to Fill Out MI Medical Claim Forms for Blue Shield Billing
4401 13 013	How to Find Out Diagnosis Codes in the HICDA Manual
4401 13 014	How to Find Procedure Codes in the MI Uniform Procedure Code Manual

Unit 14 Patient Teaching

4401 14 001	How to Instruct a Patient to Walk Using Crutches

Unit 15 Skill Building

4401 15 001	Clinical Experience - Classroom or Other CACC Setting
4401 15 002	Vocabulary Skill Building
4401 15 003	Clinical Experience - Related Occupation and Exposure
4401 15 004	Clinical Experience - Student Manager
4401 15 005	Clinical Experience - Physician's Office or Related Area
4401 15 006	Spelling Skill Building

Unit 16 Bookkeeping

4401 16 001	How to Use the Pegboard System for Daily Receipts
4401 16 002	How to Prepare Statements for Mailing to Patients With Overdue Accounts
4401 16 003	Using Bank Card or Master Charge
4401 16 004	How to Schedule a Patient's Appointment
4401 16 005	How to Change Patient Appointments
4401 16 006	How to Use a Daybook, etc.
4401 16 007	How to Write A Check
4401 16 008	How to Use a Calculator
4401 16 009	How to Balance a Daybook
4401 16 010	How to Write Numbers Into Words and Words Into Numbers

Unit 17 Interpersonal Relationships

4401 17 001	How to Solve Some Problems Between Medical Office Workers
4401 17 002	How to Know What to Do in Situations Involving Medical Law and Medical Ethics

Unit 18 Medical Office First Aid

4401 18 001	How to Instruct a Patient in the Care of Eye Emergencies
4401 18 002	Emergency Treatment for Burns
4401 18 003	Recognition and Control of Bleeding in Emergency Situations
4401 18 004	How to Care For and Instruct a Patient to Care for Fainting, Etc.
4401 18 005	How to Care for Aspirated Foreign Body and Swallowing of Poisonous Substances

Unit 19 Banking

4401 19 001	Making a Bank Deposit Into Checking Account
4401 19 002	Maintaining a Petty Cash Fund

Unit 20 Casting Procedures

4401 20 001	How to Set Up the Equipment for a Cast Application
4401 20 002	How to Clean Up After a Cast Application

DIETETIC ASSISTANT

Unit 1 Nutrition

4501 01 001 Basic Nutrition Terminology
002 Digestive System and Basic Nutrition Terminology
003 Planning a Nutritious Menu
004 Obtaining a Diet Recall
005 Evaluating a Diet Recall (Quick Method)
006 Using Bowes & Church, A Handbook of Tables of Food Composition
007 Analyze Food Intake for Nutritional Adequacy
008 Changing Menus to the Needs of the Elderly
009 Changing Menus to the Needs of Children, Ages 1-6
010 Changing Menus to Needs of Pregnant and Lactating Women
011 Using a Diet Manual
012 Working with the Clear Liquid Diet
013 Working with the Full Liquid Diet
014 Working with the Soft Diet
015 Working with the Bland Diet
016 Working with the Low Saturated Fat Diet
017 Working with the Low Fat Diet
018 Working with the Diabetic Diet
019 Determining Total Calories in a Diet
020 Working with the Low Calorie Diet
021 Working with the Low Sodium Diet
022 Working with Allergy Diets: Allergy I
023 Working with Allergy Diets: Allergy II
024 Working with Allergy Diets: Egg Free
025 Working with Allergy Diets: Wheat Free
026 Working with Allergy Diets: Milk Free
027 Working with Allergy Diets: Mold Free
028 Working with Allergy Diets: Gluten Free

Unit 2 Menu Planning and Food Ordering

4501 02 001 Menu Planning, One Day Meals for Your Family
002 Menu Planning for a Hospital
003 Planning a Selective Menur for a Hospital
004 Adapting a Menu to Meet Physician's Orders for Soft Diet
005 Adapting Menu to Meet Physician's Orders for Bland Diet
006 Adapting Menu to Meet Physician's Orders for Low Fat Diet

4501 02 007 Adapting Menu to Meet Physician's Orders for Low Saturated Fat Diet
008 Adapting Menu to Meet Physician's Orders for Liquid Diet
009 Adapting Menu to Meet Physician's Orders for Diabetic and Low Calorie Diet
010 Adpating Menu to Meet Physician's Orders for Low Sodium
011 Taking a Physical Inventory
012 Writing a Purchase Order
013 Ordering Staples (Dry Goods)
014 Ordering Fresh Produce
015 Ordering Meat
016 Ordering Frozen Foods
017 Ordering Dairy Items
018 Ordering Baked Goods
019 Ordering Soap and Cleaning Supplies
020 Receiving Food Supplies
021 Storing Foods (Dry)
022 Storing Foods (Refrigerated)
023 Taking a Physical Inventory (Costing of Inventory)

Unit 3 Housekeeping and Safety

4501 03 001 Using an Institutional Mixer
002 Cleaning the Mixer
003 Using the Blender
004 Cleaning a Blender
005 Using a Meat Slicer
006 Cleaning the Meat Slicer
007 Using the Disposal
008 Cleaning the Disposal
009 Using the Food Grinder
010 Cleaning a Food Frinder
011 Using the Range (Gas)
012 Cleaning the Range (Gas)
013 Using the Oven (Gas)
014 Cleaning the Oven
017 Using the Toaster
018 Cleaning the Toaster
019 Using the Steam Table
020 Cleaning the Steam Table (Electric)
021 Using a Plate Warmer
022 Cleaning the Plate Warmer
023 Using a Food Warmer
024 Cleaning a Food Warmer
025 Using a Conveyor Belt
026 Cleaning Conveyor Belt

4501 03 027 Preparing Coffee
028 Cleaning the Coffee Urn
029 Conducting a Sanitation Inspection
030 Operating a Dish Machine
031 Pot & Pan Washing in a Three Compartment Sink
032 Preventing Food-Borne Illnesses by Using Proper Food Handling Techniques
033 Preventing Accidents by Using the Proper Safety Procedures
034 Teaching Porper Safety Precautions
035 Hand Washing for Institutional Kitchen
036 Operating a Small Commercial Dishwasher

Unit 4 Food Preparation and Service

4501 04 001 Developing Standardized Recipes
002 Adjusting a Recipe for Desired Yield - Increasing Yield
003 Adjusting a Recipe for Desired Yield - Decreasing Yield
004 Determing the Costing of a Recipe
005 Measuring Liquids
006 Measuring Dry Ingredients and Shortening
007 Weighing Ingredients
008 Requisitioning Ingredients for Recipes
009 Preparing Meat, Poultry and Fish
010 Preparing Egg, Milk , Cheese and Casserole Dishes
011 Preparing Vegetables
012 Preparing Salads
013 Preparing Breads
014 Preparing Desserts: Milk, Egg and Fruit
015 Preparing Desserts: Cake, Cookies, Pies
016 Preparing Appetizers & Hors D'Oeuvres & Sandwiches
017 Modifying Preparation for Special Diets
018 Evaluating Convenience Food
019 Testing and Evaluating New Food Products
020 Reading Labels of Food Products
021 Beginning and Maintaining a Food Produce File
022 Using a Thermometer to Test Food Temperatures
023 Setting Up a Steam Table
024 Preparing Production Schedules
025 Supervising the Production of Food Items
026 Supervising the Serving of Food to Patients
027 Serving Food in a Cafeteria
028 Figuring Quantity of Food to Purchase
029 Making a Purchasing List From a Menu for One Meal
030 Planning Menu for Special Function (Coffee)

4501 04 031 Serving a Food at Special Function (Coffee)
032 Planning a Menu for Special Function (Buffet)
033 Serving Food at Special Function (Buffet)
034 Selecting Equipment
035 Cleaning the Enterprise Automatic Percolator
036 Preparation of Coffee Using the Enterprise Automatic Percolator
037 Preparing Food in Microwave Oven

Unit 5 Diet Therapy

4501 05 001 Using the Diet Instruction Sheet
002 Teaching Diets to Patients Individually
003 Keeping Diet Records of Patients in an Institution
004 Recording Patients' Diet Instructions
005 Developing Visual Aid Materials
006 Teaching Patient on Low Fat and Low Saturated Fat Diets to Dine Away From Home
007 Teaching Diabetic and Low Calorie Patients to Dine Away From Home
008 Teaching Patient on Low Sodium Diets to Dine Away from Home
009 Helping Patient to Plan a Diet for Home Use
010 Calculating a Diabetic Diet
011 Helping Diabetic Patient Plan for Food Purchases Specific to their Nutritional Needs
012 Helping a Patient (on a Low Sodium and Low Saturated Fat Diet) Plan Food Purchases Specific to His/her Nutritional Needs
013 Helping a Patient Plan for Food Purchases Specific to Nutritional Needs Within Budget
014 Helping a Patient to Plan for Food Preparations Which are Part of His/her Nutritional Care
015 Following Up on Diet Instructions
016 Evaluating Results of Diet Instructions and Observe the Recording of Results in Patient's Cha
017 Instructing a Patient on a Low Fat Diet
018 Instructing a Patient on a Bland Diet
019 Instructing a Patient on a Weight Reduction Diet
020 Instructing a Patient on a Diabetic Diet
021 Instructing a Patient on a Low Sodium Diet
022 Instructing a Patient on a Low Saturated Fat Diet
024 Teaching Diets to Patients in Groups
025 Preparing a Feeding for Nasogastric Tube

Unit 6 Supervising Tools and Techniques

4501 06 001	Interviewing New Employees
002	Selecting New Employees
003	Orienting New Employees
004	Scheduling Employees
005	Rating Employees
006	Evaluating Employees
007	Training Employees
008	Writing Job Descriptions
009	Writing Procedures
010	Solving Problems
011	Applying Work Simplification Principles to Jobs
012	Supervising Employees Effectively

SMALL ENGINE

Unit 1 Engine Block

7501 01 001	Remove and Replace Engine Base Sump and Lower Oil Seal
002	Remove and Replace Sump on Auxilary PTO Type B & S Engine
003	Remove Cylinder Head, Check for Warp, Attach to Block and Torque
004	Servicing Camshafts
009	How to Take Apart, Look Closely at and Clean Engine Parts
016	R & R Oil Seal Power Products 2 Cycle Engine
017	How to Check Crankshaft End Play
021	Remove and Replace Crankshaft
022	Inspect and Mike Crankshaft of a 2 or 4 Cycle Engine
023	Replace Crankshaft
024	Check Oil Pump
025	Check Dipper or Slinger
026	Remove Crankshaft From a 2 or 4 Cycle Engine

Unit 2 Air Cleaner

7501 02 001	Air Filter Service
002	Check for Air By-Passing the Air Filter

Unit 3 Starters

7501 03 001	Remove and Replace Starter
002	Replace Recoil Springs
003	Remove and Replace Starter Clutches
004	Replace Starter Rope
005	Wind Up Starter
006	Tecumseh Ratchet Starter Removal
007	Recumseh Wind Up Spring Removal

Unit 4 Fuel Tank, Lines, Filters and Pumps

7501 04 001	Removal, Cleaning, and Replacement of Fuel Tanks and Filters
002	Removal, Replacement and Checking Fuel Lines for Wear and/or Leaks
003	Removing, Replacing and Rebuilding Fuel Pumps, Cleaning and Servicing Sediment Bowls

Unit 5 - Carburetors

7501 05 001	Carburetor Overhaul (Bowl Float Type)
002	Carburetor Overhaul (Diaphragm Type)
003	Carburetor Overhaul (Sliding Valve)
004	Carburetor Overhaul - Suction Type
005	Remove and Replace Carburetor
006	Service and Adjust Governors
007	Engine Running Set High and Low Speed Adjustments

Unit 6 - Electrical

7501 06 001	Checking an Electric Start System
002	Check AC Charging System
003	Remove Starter or Starter Generator and Check
004	Remove, Replace and Install Electrical Parts

Unit 8 - Magneto System

7501 08 002	Remove, Replace and Check Flywheel, Points, Condenser and Coil
003	Remove and Replace Armature Plate Assembly and Retime Engine (Tecumseh)

Unit 9 - Lubrication

7501 09 001	Lubrication - Check Manual and Service

Unit 10 - Gear Boxes and Drive Trains

7501 10 001	R & R Transaxle John Deere Tractor (200 Series)
002	Remove and Replace Drive Belt on a Simplicity Model 4108 8 HP Tractor (Also Model 4008)
003	Remove and Replace Gear Box Jacobson Riding Mower (Model 42635)
004	Adjust Variator and Brake Linkage (John Deere Tractor 200 Series)

Unit 11 - Sharpening and Grinding Mowers

7501 11 001	Sharpening Rotary Mower Blades and Balance

Unit 13 - Test Equipment

7501 13 001	Condenser Capacity Test
002	Coil Power Test
003	Coil Surface Insulation Test
005	Dynomometer - Mark II
006	Condenser Leakage and Short Test
007	Condenser Series Resistance Test
008	Primary Resistance Test
009	Coil Continuity Test

Unit 14 - Motorcycle

7501 14 001	Timing a Single Cylinder (Flywheel Covering Points) Magneto System Only
002	Timing a Single Cylinder Points Accessible
003	Timing a Two Cylinder with Single Points (Points Accessible)

Unit 15 - Engine Removal and Replacement

7501 15 001	Remove and Replace Engine, Align to Drive Train
002	Remove and Replace Engine on Push Mower
003	Remove and Replace Engine on Self Propelled Mower
004	Remove and Replace Engine on Electric Start Riding Tractor (Simplicity)
005	Remove and Replace Engine on Riding Mower (Jacobsen)

Unit 16 - Machining

7501 16 001	How to Install a Helicoil Kit
002	Drilling, Removing and Tapping Broken Studs
003	Cylinder Hones: How to Identify Them and How They are Assembled
004	How to Hone Cylinders Using Hones JN and AN Models
005	How to Use a Torque Wrench
006	How to Use an Electric Impact Wrench
007	How to Use an Air Impact Wrench
008	How to Use an Air Ratchet Wrench

Unit 18 - Tune Ups

7501 18 001 Minor Tun Up on Air-Cooled Engine (2 or 4 Cycle)
002 Tune Up Engine on Riding Mower (Minor)
003 Tune Up Engine Chainsaw
004 Tune Up Engine, Snowmobile

Unit 19 - Short Blocks

7501 19 001 Install a Short Block in a 2 Cycle Engine
002 Install a Short Block in a 4 Cycle Engine

Unit 21 - Storage

7501 21 001 Preparing a Mower for Winter Storage
002 Preparing a Chainsaw for Storage
003 Preparing a Snowmobile for Storage

Unit 22 - Filling Out Forms

7501 22 001 Writing a Work Order Properly

Unit 23 - Ring and Piston Service

7501 23 001 How to Remove and Install Piston Rings
002 How to Install Piston Rings on the Piston in the Correct Order
003 Deglaze Cylinders and Check End Gap
004 Using a Piston Ring Compressor and Spacing the Ring End Gaps
005 Checking Ring Land Clearance
010 How to Service Pistons and Rings

Unit 24 - Valve Service

7501 24 001 Remove and Replace Valve Chamber Breather or Cover
002 Remove and Replace Valve Spring
003 Valve Parts Identification, Check Valve Margin
004 Identify Parts of Valve Ports
005 Repair Valve Guides on Clinton or Tecumseh Engine
006 Install Valve Guides in Aluminum Block B & S Engine
007 Remove and Replace Valve Guides in Cast Iron B & S Engine
010 Service Valves